EPA COMMENTS
DRAFT ENVIRONMENTAL IMPACT STATEMENT
DONLIN GOLD PROJECT

Section	Page	EPA	Original Language	Proposed Language, Comment and/or Recommendation	Disposition
Executive Summary					
ES 1.3	3	cg	The project would take place in three phases: the construction phase, the operations and maintenance (operations) phase, and the closure, reclamation, and monitoring (closure) phase).	The last parentheses does not have a matching opening one.	
ES 2.2	7	cg	include a thirdparty to transport	include a third-party to transport	
ES 2.2	7	cg	third-party), a dedicated new fleet of river barges and tugs, the Angyaruaq (Jungjuk) Port, a 30-mile access road, and a 5,000-foot dedicated airstrip.	There are spacing issues here – a hard return after the) when there shouldn't be one	
ES 2.2.1	8	cg	During the 4 year construction phase	Should it be "3 – 4 year"	
ES 2.2.1.1	9	cg	Initial mining operations would use	Would the equipment needed change after the initial start of mining?	
2.2.1.4	12	LE	"…PAG 6 would be placed in permanent, isolated cells in the WRF…"	Since the WRF is described as unlined, it would be worth adding a sentence or at least a few words describing the construction of the isolated cells at this point. How is the PAG 6 isolated?	
2.2.1.4	12	LE	"… 5 million tons of PAG 5 waste rock would be used for construction of lined containment portions of the TSF."	Does this refer to the cells discussed above? Would be preferable to describe them as lined in the first mention, if so. Where in the construction do these 5 million tons go? To form the sides of the cell? Above or below the liner? Where does the rest of the PAG 5 go? Dispersed throughout the remainder of the WRF? I understand this is the Exec Summary and not a detailed description of the WRF, but a few well-chosen words to describe the handling of the PAG would be helpful here.	
2.2.1.6	14	LE	"Runoff and seepage from the reclaimed WRF would be pumped to the pit."	Specify the time period for this pumping	
2.2.3.1	18	LE	Pig Launcher and Receiver Stations	First mention of pigs and pig launcher/receiver stations should	

				explain just a bit about what they are and the purpose they serve. It seems unlikely all readers will be familiar with the term.	
2.2.3.2	19	LE	Shoofly roads	Define this term when it is first used	
ES 2.3	25	cg	At present, LNG-powered haul trucks are not currently in full commercial production	Delete "currently" – it is redundant to "at present"	
ES 2.5	26	cg	About 69 river miles below the proposed Angyaruaq (Jungjuk) Port site and 123 river miles upstream from Bethel	BTC is 75 rivers miles below Jungjuk and 124 miles upstream of Bethel (see Page 2-152)	
ES 2.5	27	cg	An approximately 75-mile, 30-foot wide, allseason gravel access road (about 2.5 times longer than the mine access road proposed in Alternative 2)	The road would be 76 miles long and only about 1.5 times longer (see page 2-152)	
ES 2.5	27	cg	BTC road would cross 39 waterbodies	40 waterbodies (see page 2-157)	
2.6	27	LE	"… to avoid the perceived risk of accidental releases"	Delete "perceived." The term risk already accounts for both likelihood and consequences. Even low-likelihood events can be "risks".	
ES 3.2	33	cg	The effects of other action alternatives on surface water hydrology would be similar to those of Alternative 2.	Section 3.2 is about Groundwater not surface water.	
ES 3.3	34	cg	Alaska Pollution Discharge Elimination System	Alaska Pollutant Discharge Elimination System	
ES 3.3	35	cg	Alternative 4 (BTC Port) would slightly increase surface water impacts due to stream crossings and runoff along the longer access road,	Chapter 2 says that there are more stream crossings under Alternative 2 (51 see page 2-53) than Alternative 4 (40 see page 2-157)	
ES 3.6	41	cg	The net effect on employment would be similar because the increased workforce required to construct a longer road would offset the decreased workforce required to operate barges.	It would seem that the increase in workers (or time for existing workers) to build the road over the 3 – 4 year construction period would not offset the workforce necessary to operate barges over the 27.5 year life of the mine.	
ES 3.7	43	cg	reduce river barging distance by 39 percent	38 percent (see page 2-152)	
ES 3.7	43	cg	A longer mine access road (75 miles; 250 percent longer)	A longer mine access road (76 miles; 153 percent longer) see page 2-152	
Table ES-	53	KW	Climate and Meteorology Section 3.4	Provide a summary of impacts (i.e. ranking) for the climate	

13				and meteorology section in order to be consistent with all other project components.	
Table ES-13	ES-60	LE	Section 3.6 is labeled just "groundwater"	Should be "groundwater hydrology" since ground water and surface water quality are in a separate water quality section	
Table ES-13	82	KW	Environmental Justice Section 3.19	Highlight and bold the summary impacts as in order to be consistent with all other project components.	
CHAPTER 1. PURPOSE AND NEED					
1.1.2	4	cg	the PHMSA	The rest of the chapter uses just PHMSA without "the" when referring to the agency itself	
1.2	8	cg	Which would produce approximately one million	Figure 1.3-1 says production will be greater than 1 million ounces so should ">" be replaced by "~" there or should "approximately" here be replaced by "more than"?	
1.3.1	8	cg	for Environmental Impact Statements	for EISs – EIS is already used in Section 1.1	
1.3.2	9	cg	The proposed pipeline is designed as a privately-owned facility	How does the pipeline being a privately owned facility mesh with the discussion of it being a common carrier in Section 2.3.2.3.6?	
1.3.4	9	cg	guidance also must be followed	Suggested: guidance must also be followed	
1.3.4.1.1	10	cg/ kw	The Corps may authorize activities (such as the filling of wetlands) that are not water dependent if an applicant can show that alternative upland locations are not available or not practicable	Table 2-4.1 lists alternatives that were not carried forward but does not seem to include any alternative upland locations to avoid the filling of wetlands or other waters of the US nor does it detail alternate configurations of the components within the mine site which might reduce impacts to aquatic resources or consider a reduction in the mine footprint" Specific citation to how this is a requirement of the 404(b)(1) guidelines should also be included.	
1.3.4.2	10	cg	The BLM	"The" is used with BLM more often than not but not (see top of page 11) always so please be consistent.	
1.3.5	12	cg	under Title 49, USC Chapter 601 to	Section 1.1.2 provides the format for this type of citation as 49 USC 601 (followed for subsequent citations on page 14)	
1.4.1	13	cg	that dredged or fill material should not be discharged into	Should avoidance and minimization be discussed?	

			wetlands and other waters unless it can be demonstrated that the discharge will not have unacceptable adverse impacts on those waters		
1.4.2	14	cg	for a pipeline ROW permit	Permit is not generally used with ROW. Is Donlin applying for a permit or just the ROW?	
1.4.3	14	cg	Title 49, USC Chapter 601	49 USC 601 (see other citations on this page)	
1.4.3	14	cg	It develops safety regulations and	It develops regulations and	
1.4.3	14	cg	performance standards that set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety	performance standards that set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve these required levels	
1.4.4	15	cg		This section does not mention either CERCLA or EPCRA both of which are mentioned in Section 2.3.2.1.11 as applicable	
1.5	19	cg		An FRP is required by EPA for tank farms with the capacity to hold more than 42,000 gallons (Figure 2.3-11 says the Jungjuk tank capacity is 2.8 m gallons) and have an over water transfer of fuel (from the barge to the tanks) - see page 5-19 for reference to EPA's authority for FRPs	
1.8.2	21	cg	in relation to "Essential Fish Habit" consultation responsibilities	Why is Essential Fish Habitat in quotation marks? Also, it was previously short cited on page 14	
1.8.2	22	cg	Streams, and high value wetlands or wetlands that might be unique or relatively scarce in the Project Area would be analyzed.	Should "would be" be changed to "will be" or "are" since the DEIS is meant to provide this analysis?	
1.8.2	23	cg	An ANILCA Section 810(a) Evaluation and Finding will be required	An ANILCA Section 810(a) Evaluation and Finding is required	
1.9.3	1-24	MJ	Source and method of production for natural gas by the project.	The source of natural gas for the proposed pipeline was considered, but eliminated from further analysis. We recommend that the EIS evaluate the types of facilities that would be needed to handle and/or store the natural gas prior to transportation to the mine site and the associated direct, indirect, and cumulative environmental impacts. For example, if the source of natural gas is from Cook Inlet, then the existing natural gas infrastructure in southcentral Alaska could	

				accommodate the natural gas. However, if the source of natural gas is from shipments of liquefied natural gas (LNG) from the Pacific Northwest (United States), Canada, and/or abroad, then the EIS should evaluate the proposed facilities that would be needed to accommodate the LNG handling and storage. Port MacKenzie, in the upper Cook Inlet, may be a viable LNG handling and storage facility. An LNG plant is proposed for Port Mackenzie, which is accessible to the existing natural gas pipeline infrastructure. In Alternative 3B, the DEIS identified several sources of diesel fuel for the proposed diesel pipeline, either transported by ocean vessels from the Pacific Northwest to the Tyonek North Foreland Dock, or from the Tesoro Refinery in Nikiski, Alaska. For a balanced and consistent analysis, we recommend that the EIS identify the source of natural gas for the pipeline under Alternative 2 (Proposed Action), and the infrastructure needed for its transportation, handling, and storage. We recommend that the environmental impacts associated with these facilities be evaluated in the EIS.	
1.10.4.1	27	cg	The estimated financial assurance amount associated with the IWMP will be subject to a public review period during the public review of the IWMP. During the review period, any person who disagrees with the decision may request an adjudicatory hearing in accordance with 18 AAC 15.195-340 or an informal review by the ADEC Division Director in accordance with 18 AAC 15.185.	The review period is the time to let the public know about the tentative decision. No adjudicatory hearing could be requested until a final decision was made – after the review period.	
1.10.4.2	28	cg	grants broad powers to the Alaska Commissioner of Natural Resources	grants broad powers to the Commissioner of the Alaska Department of Natural Resources	
1.10.6	29	cg	ANSCA..	ANSCA.	
1.10.22	32	cg		Shouldn't there be a US Code reference included for RCRA?	
1.10	1-33	MJ		*Presidential Memorandum: Mitigating impacts on Natural Resources from Development and Encouraging Related Private Investment* was issued on November 3, 2015. This memorandum should be included in the EIS to address the	

				"net benefit goal" for mitigating impacts from natural resource use. The Memorandum can be downloaded at: https://www.whitehouse.gov/the-press-office/2015/11/03/mitigating-impacts-natural-resources-development-and-encouraging-related	
1.10	1-33	MJ		*Memorandum for Executive Departments and Agencies on Incorporating Ecosystem Services into Federal Decision Making* was issued on October 7, 2015. The memorandum directs federal agencies to factor the value of natural infrastructure and ecosystem services into federal planning and decision-making by taking an ecosystems service approach. The Memorandum can be downloaded at: https://www.whitehouse.gov/sites/default/files/omb/memoranda/2016/m-16-01.pdf	
1.10	33	cg		No description of EPCRA is included	
1.10.24	33	cg	The Mine Safety and Health Administration (MSHA) administers the provisions of the *Mine Act* (30 CFR 22)	Since the title of the section is the federal Mine Safety and Health Act of 1977, is this the Mines Act? And shouldn't there be a US Code citation for the Act rather than a regulatory reference?	
1.10.27	1-33	MJ		*E.O. 13690 and New Floodplain Guidelines:* On October 8, 2015, new guidelines were issued by the Water Resources Council to implement E.O. 11988 and E.O. 13690 and calls for "agencies to use a higher vertical flood elevation and corresponding horizontal floodplain than the base flood for federally funded projects to address current and future flood risk and ensure that projects last as long as intended." and continue to emphasize integrating implementation of E.O. 11988 with NEPA. Two other concepts included in the guidelines are the use of natural systems in floodplain management and the need to consider potential impacts to vulnerable populations. The guidelines can be obtained at: http://energy.gov/sites/prod/files/2015/10/f27/FloodPlainsGuidlines2015.pdf	
Table 1.10-2	36	cg		EPA can review DEC air permits	

Table 1.10-2	37	cg		Are the second 2 items under USDOT/PHMSA really PHMSA things or does USDOT alone need to be the title? Is FAA part of USDOT or is it an independent agency?	
Table 1.10-2	38	cg	U.S. Department of the Treasury, Bureau of Alcohol, Tobacco, and Firearms	U.S. Department of the Treasury, Bureau of Alcohol, Tobacco, Firearms, and Explosives	
Table 1.10-2	39	cg	ADEC provides approval for treatment and disposal plans for industrial wastewaters	ADEC provides approval for treatment and disposal plans for industrial and domestic wastewaters	
CHAPTER 2. ALTERNATIVES					
General Comment					
LEDPA		MJ	The DEIS does not identify a preferred alternative. We recommend that the alternatives analysis provide the information necessary to support an evaluation of alternatives under the CWA Section 404(b)(1) Guidelines, including information to support identification of the least environmentally damaging practicable alternative (LEDPA).		
Preferred Alternative		MJ	We recommend that the EIS identify a preferred alternative that incorporates components of Alternative 3A (LNG Powered Trucks), 3B (Diesel Pipeline), and 5A (Dry Stack Tailings with liner option) into Alternative 2 (Proposed Action) to avoid and minimize potential adverse impact to the Kuskokwim River. This may also represent the environmentally preferred alternative. Due to concerns about potential groundwater migration and leaching of contaminants from the WRF and the lower contact water pond, we recommend that the environmentally preferable alternative include a synthetic impermeable liner for the WRF and the contact water ponds at the mine site. From Alternative 3A, the environmentally preferable alternative would use LNG or natural gas, rather than diesel, to power all trucks, vehicles, and certain facilities at the mine site. The environmentally preferable alternative would include both a natural gas pipeline (Alternative 2) and diesel fuel pipeline (Alternative 3B) within the same right-of-way, and identify the sources of natural gas and diesel fuel so that the direct, indirect, and cumulative environmental impacts could be adequately evaluated for the necessary transportation, handling, and storage facilities. The environmentally preferable alternative would manage and store mine waste tailings using both a subaqueous disposal and dry stack tailings method (Alternative 5A). Dry stack tailings could be implemented during the summer months, and the subaqueous disposal method in the colder winter season.		
2.3.1	6	cg	Minerals Leasing Act (MLA) ROW	Minerals Leasing Act (MLA) Right of Way (ROW) – not previously short cited in Chapter 2	
2.3.1	7	cg	59,000 stpd	59,000 tpd – the previous paragraph just explained that "ton" would have the meaning of "short ton"	
2.3.1	8	cg	to Angyaruaq (Jungjuk) Port, or be off-loaded for temporary storage. From Angyaruaq (Jungjuk) Port	Does every occurrence of Angyaruaq have to be followed by (Jungjuk)?	

2.3.2.1	8	cg	a waste rock facility (WRF), ore processing facilities, a tailing storage facility (TSF),	a WRF, ore processing facilities, a TSF – both were previously short cited	
2.3.2.1	8	cg	422,000 stpd.	422,000 tpd.	
2.3.2.1.4	17	cg/ LE	Auxiliary fleet vehicles would be used for road maintenance, bench development in the open pit, construction of the WRF, and miscellaneous mine site projects. Graders would maintain the haul roads, including the mine access road. Water trucks would spray roads and working areas to mitigate dust impacts to air quality.	This paragraph is not about Flotation so should be removed or moved to its appropriate location (it is also found in 2.3.2.1.3)	
2.3.2.1.5	21	cg	Table 2.3-2	What do the footnotes refer to?	
2.3.2.1.6	24	cg	Table 2.3-3	"Short Tons" should be "Tons"	
2.3.2.1.7	25	cg	Alaska Pollution Discharge Elimination System (APDES) permit	Alaska Pollutant Discharge Elimination System (APDES) permit	
2.3.2.1.7	25	LE	Contact water definition: final statement is that it does not include pit dewatering wells, but next sentence in main text describes treating that water. On the next page (2.26), there is more explanation, but it still isn't 100% clear. Water from dewatering wells (regardless of location), although not "legally" defined as contact water, will be treated and discharged as if it were? Is that the bottom line? One source of confusion was having dewatering water and water collecting in the bottom of the pit contained in the same bullet on p 2-25.	Clarify the treatment and handling of water from pit dewatering.	
2.3.2.1.7	26	cg	the total volume pumped out during the operation period is estimated to be 56,100 acre-feet.	this paragraph talks of gallons then gives the final total in acre-feet. Is this because the total in gallons is an enormous number?	
2.3.2.1.8	2-30	MJ		Evaporators – Are these structural controls still part of the proposed action? This was not mentioned here. What is the efficiency of evaporators to remove water from the TSF? How much water can be removed? How well do these work in the winter season?	
2.3.2.1.9	2-30	MJ	Waste Rock Facility	We have concerns that the Waste Rock Facility (WRF) and the	

				contact water ponds may be potential sources of groundwater contamination. We believe Alternative 2 should include consideration of a synthetic impermeable liner for the WRF and the contact water ponds, particularly the lower contact water pond. For a balanced and consistent alternatives analysis, we recommend that the EIS evaluate two options for the WRF and contact water ponds, one with a liner and one without. In Alternative 5A, both a liner and no liner was evaluated. Also we recommend additional monitoring and testing of groundwater quality from the WRF.	
2.3.2.1.9	30	cg	either PAG or NAG	either PAG or non-acid generating (NAG) – NAG not previously short cited in Chapter 2	
2.3.2.1.10	2-35	MJ	…and Oil Discharge Prevention and Contingency Plan would…	…and Oil Discharge Prevention and Contingency Plan (Appendix R) would…	
2.3.2.1.10	2-36	MJ	The landfills at the mine site would be constructed as trenches within the WRF in an area covering approximately 16 acres.	Since the WRF would be unlined, would the 16 acres landfill trench within the WRF be lined to meet ADEC landfill permit requirements at 18 AAC 60? How will the landfill be monitored for leachates?	
2.3.2.1.11	38	cg	Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 103; Emergency Planning and Community-Right-to-Know Act of 1986; Title III of the Superfund Amendments and Reauthorization Act	Neither the CERCLA nor the EPCRA requirements are included in Chapter 1	
2.3.2.2.1	2-46	MJ		The DEIS evaluates the potential for barges to become grounded in the Kuskokwim River bed during low flow conditions. The Kuskokwim River becomes shallower going further upriver. We have concerns regarding barge stranding on the Kuskokwim River as it would result in increased bed scour, turbidity, wave energy, shoreline erosion, and adversely affect habitat for fish migration, rearing and spawning, and eggs incubating in gravel beds. We recommend that the EIS include a Barge Grounding and Response Plan for the Kuskokwim River and encourage the project proponent to work with the local communities to establish a monitoring network for potential barge grounding areas during the low	

				water season on the Kuskokwim River.	
2.3.2.2.6	2-49	MJ	No public use would be allowed.	How will this provision be monitored and enforced? Would the public be allowed to cross the road on ATV, snow machine, etc.? There should be some concessions to allow public access/crossing for recreation, subsistence activities, etc.	
2.3.2.2.6	2-49	MJ	Borrow Material Sites	We recommend that the EIS include geochemical characterization of potential new and existing gravel material source sites that would be used to construct the mine access road from the Jungjuk Port, air strips, access roads for pipeline construction and facility gravel pads. This characterization is needed to determine the volume of PAG rock material and to identify specific design features, mitigation measures, and BMP to minimize potential ARD/ML to adjacent surface waters, including wetlands. If the gravel source material is found to consist of PAG material and/or have elevated mercury and arsenic concentrations, then the fill material may be considered unsuitable fill material under the CWA Section 404(b)(1) guidelines requirements and should not be discharged into wetlands and other surface waters.	
2.3.2.2.6	2-53	MJ	Transportation Facilities – Mine Access Road	Discuss how the mine site access road would be maintained in the winter season. Describe any chemical treatments for the road.	
Tab 2.3-9	2-53	MJ	Area (acres) and Volume (m^3)	Units should be consistent - not be in metric – convert to (yds^3) for the volume.	
2.3.2.2.6	2-53	MJ	There would only be two water sources for dust control for the mine access road, listed below: South Fork Getmuna Creek and Kuskokwim River.	In regards to water extraction, recommend including the same level of detail and units of measurements for water extraction sites. Follow the same format as provided on Table 2.3-17 and Table 2.3-18. Also, for dust control for the mine access road, wetting the road may not be a good management practice if the gravel source material is PAG. Additional watering would contribute to ARD/ML and potential contamination of adjacent surface waters. We recommend evaluation of alternative dust suppression methods for the gravel access road, such as an	

				impermeable, inert cap, chip seal, etc.	
Table 2.3-10	2-53	MJ	Volume (m^3)	Volume should be ($yards^3$). Keep units consistent, such as for Area (acres) for consistent comparison.	
Table 2.3-10	2.53	MJ		For each stream crossing, identify the presence/absence of anadromous fish. Include a column for the length of bridge span (ft) and culvert diameter (in). See Table 2.3-38 for example.2.	
2.3.2.2.7	2-55	MJ		Discuss how the airstrip would be maintained in the winter season. Describe any chemical treatments for the airstrip.	
2.3.2.3.2	64	cg	PIPELINE – FIBER OPTIC CABLE	The text of this section does not explain what the fiber optic cable will be used for	
2.3.2.3.3	64	cg	associated valves at the 16 remote MLV	Page 2-69 says there are 20 MLV, with 4 being co-located with other facilities. Should those 4 be mentioned in this section, too?	
2.3.2.3.3	69	cg	The remaining 16 block valve locations would consist of valve operators, small-bore piping, and associated valves above-ground. All of these valves would be manually operated	It appears that the non-remote valves could be operated either manually or automatically but the remote valves could only be operated when someone was present (manually)? Please clarify. ES19 states: "Mainline valves would close in the event of a pipeline leak to minimize loss of contents." Which makes it sound like there is some automation to them.	
Tab 2.3-17	2-77	MJ		Identify presence/absence of anadromous fish overwintering. Discuss measures to minimize impacts to fish during water withdrawal.	
Tab 2.3-18	2-78	MJ		Identify presence/absence of anadromous fish overwintering. Discuss measures to minimize impacts to fish during water withdrawal.	
Tab 2.3-19	2-81	MJ		Same information as provided in Table 2.3-32. HDD Estimated Water Us.	
Tab 2.3-20	2-81	MJ		Depict the location of the access roads on a map	

Tab 2.3-21	2-83	MJ		Depict the location of the shoofly access roads on a map.	
2.3.2.3.4	89	cg	All camp waste, including sewage and gray water, would be treated as required and disposed of in accordance with ADEC requirements	This is the applicant's alternative so what disposal method is being proposed?	
2.3.2.3.4	95	MJ	Borrow Material Sites	We recommend that the EIS include geochemical characterization of potential new and existing gravel material source sites that would be used to construct the mine access road from the Jungjuk Port, air strips, access roads for pipeline construction and facility gravel pads. This characterization is needed to determine the volume of PAG rock material and to identify specific design features, mitigation measures, and BMP to minimize potential ARD/ML to adjacent surface waters, including wetlands. If the gravel source material is found to consist of PAG material and/or have elevated mercury and arsenic concentrations, then the fill material may be considered unsuitable fill material under the CWA Section 404(b)(1) guidelines requirements and should not be discharged into wetlands and other surface waters.	
3.5.3.2.2	3.5-103	MJ	Wave Induced Bank Erosion	In order to minimize shoreline erosion of the Kuskokwim River from increased barge traffic during operations, we recommend incorporating Alternatives 3A and 3B into the preferred alternative. Alternative 3A would reduce river fuel barge traffic from 122 to 83 roundtrips, which would reduce erosion rates approximately 1 to 4 percent. Alternative 3B would reduce river fuel barge traffic from 122 to 64 roundtrips, which would reduce erosion rates approximately 1 to 3 percent. We recommend additional design features and mitigation measures that should be included in the EIS to minimize shoreline erosion: (1) establish specific barge speed limits on the Kuskokwim River (upstream and downstream), (2) combine different fuel and cargo loads for each barge raft, (3) establish appropriate loads for fuel and/or cargo barges based	

				on water levels and depths to minimize wave energy, and barge grounding.	
2.3.2.3.5	108	cg	minimize the amount of time the trench is open. The intent would be to close the trench as soon as practical. The pipeline construction plan calls for minimization of open trenches for construction purposes.	Does this say the same thing 3 times?	
Tab 2.3-32	2-118	MJ		Same information as provided in Table 2.3-19. HDD Estimated Water Use.	
2.3.2.3.5	123	cg	Erosion Sediment Control Plan and a SWPPP prior	Erosion Sediment Control Plan and a Storm Water Pollution Prevention Plan (SWPPP) prior – not previously short cited in Chapter 2	
2.3.2.3.5	2-127	MJ	All pressure testing would most likely be done in summer to avoid the need for antifreeze.	The DEIS indicates that 68% of pipeline construction would be conducted in the winter season. Please explain how winter hydrotesting could be avoided.	
2.3.2.3.5	2-127	MJ	Volumes of water required would vary depending on hydrotest segment length but could be up to 15 Mgal.	Provide a table identifying the location of water sources for hydrostesting, similar to Tables 2.3-17 and 2.3-18, which identifies the location, season of use, waterbody type, years of use, extraction rates and annual volumes. Include information regarding presence/absence of fish. We recommend that the EIS evaluate the project water resource requirements for all of the action alternatives, not just the Proposed Action. We recommend that the EIS evaluate the year round water use resources, locations, and volumes. For each type of water resource (river, stream, lake, pond – permanent, intermittent, ephemeral, perennial), there should be a description in a table of the maximum and minimum surface area, depths and width of the water resource, available water volumes, volume of proposed withdrawal, winter and/or summer withdrawal, presence/absence of resident and/or anadromous fish species. The EIS should describe measures, such as screening, that would be implement to minimize impacts to fish. Additional mitigation measures should include establishing water	

				withdrawal rates, timing of water withdrawal to avoid fish migration, spawning, and incubating eggs. The location of water resources should be included on a map and/or aerial photograph. This additional information is need to adequately evaluate the direct, indirect and cumulative impacts to the aquatic resources and should not be deferred until the permitting process.	
2.3.2.3.5	127	cg	An APDES permit would be acquired for the discharge of hydrostatic testing water. Once hydrostatic testing has been completed, test water would be discharged back to an approved location through a filtration device. Discharge of the hydrotesting water may require a wastewater discharge permit if any foreign substances are added to the water. Water used for pipeline test purposes would be tested before discharge, as required by project permits.	The end of one paragraph says a permit would be acquired for discharge but the next paragraph says a permit may be required. If the discharge is to waters of the U.S., an APDES permit would be required.	
2.3.2.3.5	2-127	MJ	Once hydrostatic testing has been completed, test water would be discharged back to an approved location through a filtration device.	Identify the discharge location(s) of hydrostatic test water in rivers, lakes, ponds, streams, wetlands, uplands, etc. Estimate the volume of hydrostatic test water to be discharged.	
2.3.2.3.6	128	cg	The pipeline would have common carrier status	Section 1.3.2 states "The proposed pipeline is designed as a privately-owned facility" Are the two statements contradictory?	
2.3.2.3.6	128	cg	The pipeline would have common carrier status and therefore may not be decommissioned after mine life. As a condition	if it can't be decommissioned, then why is that Donlin's plan? consider: The pipeline would have common carrier status and therefore decomissioning may not be required after mine life.	
2.3.2.3.6	129	cg	capping with 0.25-inch steel plant	Should "plant" be "plate"?	
2.3.2.3.7	132	cg	Other monitoring activities include cultural resources monitoring. A Non-Native Invasive Species Prevention Plan would be developed	should include a bit more on cultural resources and put invasive species in its own paragraph	
2.3.2.3.7	133	cg	Table 2.3-33: **Construction; Operations and Maintenance' and**	The apostrophe should be deleted.	

2.3.2.1.7	141	LE	Monitoring frequency "... would range from quarterly to 5-year intervals depending on the number of years after closure."	Is this based on an assumption that variability would decrease over time? If so, that assumption should be verified by including plots of the data in summary reports submitted at the time the monitoring frequency is reduced.	
2.3.3	2-142	MJ	Alternative 3A would use liquefied natural gas (LNG) instead of diesel to power the large (+300-ton payload) trucks that would move waste rock and ore from the open pits.	According to the DEIS, LNG-powered haul trucks may not be commercially available at this time, but the technology to use natural gas is proven and companies are developing the technology. We recommend that Alternative 3A evaluate the use of LNG and/or natural gas for all trucks, including the trucks hauling cargo and fuel on the mine access road from the Jungjuk Port. In addition, we recommend that the EIS evaluate the opportunity for other aboveground facilities at the mine site to be powered by LNG and/or natural gas.	
2.3.3	142	cg	Alternative 3A would also reduce the barging of diesel fuel to a peak of 19 fuel barge tow round trips per year, compared to the peak of 58 required under Alternative 2. This would result in a 32 percent reduction in peak total river barge traffic	The reduction is 58 - 19 = 39 so the reduction is 39/58 = .67 or 67%	
2.3.3.1	2-142	MJ	This would reduce the peak annual diesel consumption from 42.3 Mgal to 13.3 Mgal.	Also express this as a percent reduction in diesel fuel consumption = 69% reduction?	
2.3.3.1	2-142	MJ	Natural gas useage would increase from 11.2 bscf/year to 15.5 bscf/year.	Also express this as a percent increase in natural gas useage = 69% increase.	
2.3.4	2-145	MJ	Alternative 3B would require improvements to the existing Tyonek North Foreland Barge Facility and transportation of diesel fuel in Cook Inlet.	We recommend that Alternative 3B evaluate options for diesel fuel delivery that would eliminate impacts to the Native Village of Tyonek, and modifications to the North Foreland Dock Facility. For example, fuel delivery could include evaluation of Port MacKenzie on the west side of Knik Arm, and connection of a diesel pipeline to Beluga using Horizontal Directional Drilling (HDD) below the Susitna River. This would avoid the need for the additional 19-mile pipeline segment from the North Foreland Dock facility to Beluga. In addition, the DEIS indicates that diesel fuel could be obtained from the Tesoro Refinery in Nikiski on the Kenai Peninsula (east side of Cook Inlet). We recommend that Alternative 3B evaluate a	

				subsea pipeline in Cook Inlet from Nikiski to Beluga.	
2.3.4.2	2-146	MJ	The existing dock at the Tyonek North Foreland Facility currently extends 1,500 feet from shore to water depth of approximately 21 feet. The dock would need to be extended an additional 1,500-ft to accommodate vessels in excess of 30,000 gross tons…	Identity the water depth and draft requirements at the TNF facility to accommodate vessels in excess of 30,000 gross tons. Another option to extending the existing dock 1,500-ft would be to consider navigational dredging to meet the desired water depth to accommodate vessels.	
Fig 2.3-39	2-147	MJ		Overlay a bathymetric map to show the water depths from shoreline.	
2.3.4.3	2-148	MJ	Figure 2.3-40 shows the 18 mile segment between Tyonek and the beginning of the natural gas pipeline route..	Additional information should be included regarding this 18-mile segment, including location/description of aboveground facilities (e.g.,, temporary work areas, access roads, water use and extractions sites, camps, PSYs, etc.), borrow needs and source sites, water needs and source sites, location of HDD crossings, hydrostatic testing water sources and discharge locations, etc.	
2.3.4.3	2-149	MJ	Options for Diesel Pipeline	There are additional options than using the Tyonek North Foreland Dock that may be less damaging and would not require dredging. If the source of diesel fuel is from the Tesoro Refinery in Nikiski, then evaluate an option for a subsea pipeline in Cook inlet to Beluga. Also, if diesel is being shipped in to Alaska, then consider the Port MacKenzie Dock facility and tie a diesel pipeline from the Port to Beluga with HDD under the Susitna River.	
2.3.4.3	2-149	MJ		Wetland impacts, areas, are needed for the diesel pipeline, particularly the 18 mile segment from Tyonek to Beluga.	
2.3.4.3	149	cg	the pipeline right-of-way [ROW]	the pipeline ROW	
2.3.4.3	2-149	MJ	Manual block valves would be installed on each bank at 27 stream crossing locations…	Include a table similar to Table 2.3-15 summarizing the locations of the block valves.	
2.3.4.3	149	cg	Manual block valves	In such remote locations? Shouldn't there be a way of closing valves that don't actually require the physical presence of a human?	
2.3.4.3	2-149	MJ	Of the 237 total drainage crossings for the entire pipeline	Specify the number of waterbody crossings requiring HDD? In	

			route…	addition to the six under Alternative 2, will this include the Beluga River? Provide HDD estimated water use similar to Table 2.3-19 or 2.3-32, and specify the length of the HDD crossing.	
2.3.4.3	149	cg	Hercules C- 130	Hercules C-130	
2.3.4.3	2-149	MJ	The airstrips required for spill response capacities include the nine new airstrips…	For the new proposed airstrips and roads, specify the location of estimated borrow material source needs, borrow sites, and water extraction sites. Refer to Tables 2.3-18, 2.3-26 and 2.3-27 for the level of information needed in the EIS for Alternative 3B.	
2.3.5	152	cg	an increase of 46 miles and 153 percent	an increase of 46 miles or 153 percent (see earlier language in the same paragraph about the decrease in barge miles 75 miles or 38 percent)	
2.3.5.2	152	cg	Alternative 4 would move the upriver port site from Angyaruaq (Jungjuk) to BTC.	This just repeats what was said in the first line of 2.3.5	
2.3.5.2	2-152	MJ	Three villages along the Kuskokwim River would experience less barge traffic under this alternative.	Three villages, Aniak, Chuathbaluk, and Napaimute, along the Kuskokwim River would experience less barge traffic under this alternative.	
2.3.5.2	154	cg	because of the longer haul road distance (~2.5 times that from Jungjuk	the road from BTC is 2.5 times as long as from Jungjuk (76/30 = 2.5) but when terms such as "longer" are used, a comparison has to be made to the difference in length - the BTC road is 46 miles longer (46/30 = 153% increase as stated in 2.3.5 above)	
2.3.5.2	154	cg	(~2.5 times that from Jungjuk	Shouldn't Jungjuk be Angyaruaq?	
2.3.5.2	154	cg	would be about 2.5 times longer than the mine access road	would be about 1.5 times longer than the mine access road (see comment above about using "longer")	
Tab 2.3-37	2-154	MJ	Area (acres) and Volume (m^3)	Units should be consistent - not be in metric – convert to (yds^3) for the volume.	
2.3.5.2	2-158	MJ	Construction of the BTC road would require installation of a temporary ice road…	For a balanced comparison of impacts between Alternatives, the EIS should include estimates of the water needs, location and quantities of water sources. Refer to Table 2.3-17 for the level of information need in the EIS for Alternative 4	

2.3.6	158	cg	Alternative 5A would evaluate an alternate tailings method	Alternative 5A evaluates an alternate tailings method – isn't this what the EIS is doing?	
2.3.6	158	cg	the conventional subaqueous tailings storage	the subaqueous tailings storage – the word "conventional" seems to bias the conversation by implying that dry stack is unconventional. Recommend removing "conventional."	
2.3.6	2-158	MJ	This alternative would use filter presses and vacuum filters to increase the solid content to more than 80 percent.	This would indicate that 20% moisture would be removed from the tailings stream after filtration. Provide an estimate of how much volume of water (gallons) would be piped to the operating pond and/or reused for the mill processing plant.	
2.36	2-159	MJ	Alternative 5A – Dry Stack Tailings	The DEIS indicates that dry stack tailings could remove up to 80 percent moisture from the mine tailings to create dry pastes. The Pogo Mine in Alaska incorporates the use of dry stack tailings as part of the operations for mine tailings disposal. We understand that the projected volumes of mine tailings generated at the Donlin Gold Mine is on a larger scale than at the Pogo Mine. We recommend the EIS evaluate options of incorporating both types of mine tailings disposal methods: dry stack tailings and subaqueous tailings (Alternative 2). The dry stack tailings disposal method could be implemented during summer seasons to address concerns about effects of freezing conditions in the winter. The goal of implementing both methods would be to remove the majority of water from entering the tailings storage facility, and to minimize the potential contamination from mine tailings resulting from an accidental breach in the tailing storage facility (TSF) dam and/or rupture of the liner.	
2.3.6.1	2-161	MJ	There is no precedent in current mining operations for using the dry stack tailings method at this production rate.	Would it be more feasible to merge DST (Alternative 5) with the subaqueous tailings storage method (Alternative 2)? The goal is to remove as much moisture from the tailings stream. Given Donlin's high production rate and the arctic conditions, would it be more feasible to use DST in the summer season and conventional tailings storage in the winter season?	
2.3.7.3	2-162	MJ		Include discussion of aboveground facilities, such as camps, airstrips, PSYs, gravel/ice roads, compressor stations, stations,	

				mainline valves, temporary work areas, etc. Also discuss any HDD crossings, Also include water needs and locations and volumes of water sources, discharge locations, etc. for dust suppression, hydrostatic testing, etc.	
Table 2.3-43	2-167	MJ		Column for Alternative 5A – Dry Stack Tailings. Since there is two options – 1 (no liner in DST) and 2, (liner in DST), consider splitting the column into two so that the impacts for each option could be evaluated separately.	
Table 2.3-43	2-167	KW		Note any changes, where applicable, to the amount of stream and wetland impacts under each of the alternatives.	
Table 2.3-44	2-172	KW	Section 3.5: Surface Water Hydrology	Denote the difference in stream impacts between Alternative 5A and Alternative 2, if any.	
Table 2.3-44	2-175	KW	Similar to Alternative 2. Wetland acres impacted by tailings storage under Option 1 would be 2,359 acres (140 acres less than Alternative 2 at 2,499 acres); under Option 2 would be 2,593 acres (94 acres more than Alternative 2). **Summary impacts would be moderate.**	Provide a discussion in Section 2.3.6 Alternative 5A regarding how this alternative would meet the 404(b)(1) guidelines for the Least Environmentally Damaging Practicable Alternative (LEDPA).	
Table 2.3-44	184	cg	250% longer	The road is only 153% longer	
Chapter 3. ENVIRONMENTAL ANALYSIS					
3.0 Approach					
General Comments					
		MJ	The DEIS (Chapter 3) combines the description of the baseline environmental conditions (Affected Environment) and the analysis of environmental effects (Environmental Consequences) for each resource. The direct and indirect effects for each resource or resource use were analyzed on the basis of the factors of intensity (magnitude), duration, extent, and context of the impact (40 CFR 1508.27). The summary impact rating thresholds are generally qualitative, but quantitative when available. These thresholds include no effect, negligible, minor, moderate, and major. We recommend providing the rationale for a given determination to provide further transparency and better inform the decision makers and the public as to the importance of practicable mitigation of adverse effects, particularly where they are moderate to minor. We also think there are instances where providing a rationale will sharpen how a threshold is applied. For example, when scientifically established quantitative thresholds are available, such as state water and air quality standards, it may not be appropriate to characterize an impact as	

			"minor to moderate" when the project may exacerbate exceedances of state and/or national standards. For example, arsenic and mercury concentrations in Crooked Creek and the Kuskokwim River both exceed the Alaska Water Quality Standards. The DEIS concludes that the environmental impacts from arsenic and mercury are "minor to moderate." We recommend that the EIS consider revising these rating thresholds and discuss design features, such as advanced water treatment, and other mitigation measures that could reduce impacts from substances such as arsenic and mercury. As currently written in the DEIS, it is not clear which effects categories will be addressed with measures to reduce impacts or whether design features are already incorporated into the ratings. For example, most of the summary ratings for construction, operations, and maintenance, and reclamation and closure of the Donlin Gold Project are "minor to moderate." We recommend the EIS clarify which levels of summary impact ratings will be addressed with measures to reduce impacts and whether design features, mitigation measures, and BMPs are already factored into the ratings. The DEIS environmental effects analysis indicates that impacts to subsistence resources and uses are "minor to moderate." These summary ratings are inconsistent with the Bureau of Land Management's (BLM) preliminary findings under the Alaska National Interest Land Conservation Act (ANILCA) Section 810 (Appendix N), which identified significant restrictions to subsistence users and resources affecting native subsistence communities living near the mine site, along the Kuskokwim River, and adjacent to the pipeline right-of-way for all of the action alternatives, including the proposed action. We recommend that the EIS resolve these inconsistencies.		
3.1 Geology					
3.1.2.1.1	4	cg	the Yukon and Kuskokwim rivers that discharge into Norton Sound and Bristol Bay, respectively	The Kuskokwim River discharges to Kuskokwim Bay north of Bristol Bay (see FIGURE 3.5-14)	
3.1.2.1.1	4	LE	"The primary drainages of the Kuskokwim Mountains physiographic province are the Yukon and Kuskokwim rivers that discharge into Norton Sound and Bristol Bay, respectively."	Doesn't the Kuskokwim discharge to Kuskokwim Bay?	
3.2.2.1.3	3.1-12	MJ	Mine Borrow Sites	Include the location of existing and proposed borrow sites on an aerial map. Include a table that includes information regarding each borrow site, such as area, depth, volume of gravel material, etc. similar to Table 2.3-9, as an example. Also, conduct geological characterization of the quality of the rock material for PAG and potential ARD/ML, Hg, and As.	
3.1.2.2.1	14	cg	The Kuskokwim River is charged by low-gradient, meandering streams within the Yukon-Kuskokwim Coastal Lowlands; it discharges southward into Kuskokwim Bay and Bristol Bay.	The Kuskokwim River is charged by low-gradient, meandering streams within the Yukon-Kuskokwim Coastal Lowlands; it discharges southward into Kuskokwim Bay.	

3.1.2.2.1	16	cg	Proposed transportation facilities outside the immediate area include additional facilities at Dutch Harbor, approximately 460 miles south-southwest of the mouth of the Kuskokwim River, across Bristol Bay.	Proposed transportation facilities outside the immediate area include additional facilities at Dutch Harbor, approximately 460 miles south-southwest of the mouth of the Kuskokwim River, across Bristol and Kuskokwim bays.	
3.1.2.2.3	3.1-18	MJ	Borrow Material Sites for Junkjuk Road and Port	Same comment as above for the Mine Borrow Sites.	
3.1.2.2.3	3.1-20	MJ	Borrow Material Sites for BTC Road and Port	Same comment as above for the Mine Borrow Sites.	
3.2 Soils					
Table 3.2-1	3.2-9	MJ	Mine Site Soil Types and Erosion Hazards	For each soil type, what is the percent occurrence at the mine site?	
Table 3.2-3	3.2-17	MJ	Soil Types and Erosion Hazards for Mine Road Alternatives	Same comment as above	
Table 3.2-4	3.2-22	MJ	Soil Types at Bethel and Kuskokwim River Floodplain and Dutch Harbor	Same comment as above	
Table 3.2-7	3.2-37	MJ	Soil Types and Erosion Hazards Along Eastern Pipeline Segment	Same comment as above	
Table 3.2-8	3.2-43	MJ	Soil Types and Erodibility Data for Central Pipeline Segment	Same comment as above	
3.2.3.2.1 NOB and SOB Stockpile Design	3.2-67	bt	The fine-grained peat/loess mixtures in the NOB stockpile…	Are these soils considered wetland soils? If so they should be segregated and re-used as growth media during wetland mitigation.	
Closure, Reclamation, and Monitoring	3.2-68	bt	It is estimated that approximately 14.7 million cubic yards (cy) of non-organic material (overburden/growth media) and 8.7 million cy of organics (peat/woody debris) would be salvaged and reused for reclamation purposes.	Are the peat soils considered wetland soils? Wetland soils should be segregated and used for wetland mitigation to the maximum amount practicable. Is the term "reclamation" being used as a synonym for mitigation in this instance?	
3.2.3.2.1	3.2-70	MJ	Jungjuk Port	Occupy an area of 26 acres. The Executive Summary indicates 21 acres (ES-15). Need consistency with numbers throughout EIS.	
3.2.3.2.1	3.2-72	MJ	Maintenance Dredging at Jungjuk Port	The DEIS indicates that maintenance dredging of the	

				Kuskokwim River would be required at the Jungjuk Port barge landing. We are concerned that maintenance dredging may adversely impact fish spawning areas and incubating eggs in the gravel, as well as alter migration patterns. There is insufficient information in the DEIS regarding the timing, frequency (e.g., annual, winter, summer), location, area, and volume of material to be dredged. We recommend the EIS provide additional details regarding the proposed maintenance dredging on the Kuskokwim River. The EIS should also analyze the proposed types of river dredging equipment that would be used (e.g., suction, clam shell, etc.) and evaluate the proposed dredge material disposal site(s) and/or beneficial use of the dredged material. These options should be evaluated in Alternative 2 (Proposed Action). The environmental analysis of the EIS should include an evaluation of the direct, indirect and cumulative impacts associated with maintenance dredging the Kuskokwim River.	
3.2.3.2.1	3.2-72	MJ	Maintenance Dredging at Bethel Port	The EIS should include a the dredging plan and discuss what is being proposed, e.g., dredging volumes, disposal area, etc.	
	3.2-75	bt	Temporary facilities	Provide an estimate of what constitutes temporary for each of these facilities. Has the temporal impacts to wetlands and other aquatic resources been included in the impacts?	
3.2.3.2.3 Pit Dewatering Water Discharge	3.2-93	bt	Energy dissipaters, erosion control measures and methods for seasonal adjustments for seasonal adjustments to prevent icing and scour would be identified and installed as need (sic) to meet storm water and water quality requirements.	We recommend monitoring the streambank downstream of the outfall in order to ensure erosion or other affects are identified and corrected as soon as possible.	
Closure, Reclamation, and Monitoring	3.2-96	Bt	The mine site would be reclaimed to pre-mine erosion conditions to the extent practicable under the Reclamation and Closure Plan and ADNR reclamation requirements.	We recommend referencing the mitigation plan as well. Mitigation opportunities should be explored on the mine site. Has Donlin explored ways to expedite reclamation in order for it to take less than several years beyond closure?	

			Large scale redistribution of topsoil would result in temporary destabilization of ground surfaces during mine site reclamation that would likely last for several years beyond closure.		
WRF	3.2-97	Bt	The Lower CWD would be breached, liner and fill removed, re-graded, and surface reclaimed to a natural state.	Would this site be a good candidate for wetland mitigation? All mine facilities should be investigated as possible mitigation sites rather than reclaiming them only.	
Mine Ste Roads	3.2-98	Bt	Asphalt road surfaces (where present) would be removed and buried in ditches and road depressions prior to grading and final reclamation.	We recommend the removal of road wastes to a licensed solid waste landfill. Although the site will be irreparably damaged from the project, site waste should not be allowed to remain after the project is completed, all solid waste should be removed to ensure the least possible impacts from the project.	
Snow Gulch Reservoir	3.2-98	Bt	The dam footprint would be recontoured and revegetated.	The dam footprint and Snow Gulch should be mitigated rather than just reclaimed. The aquatic resources should be mitigated to a higher functional value than is currently available.	
Pipeline ROW	3.2-107	bt	Stockpiles would be designed for snow storage, and would incorporate water diversion ditches to control meltwater drainage to well established vegetation or dissipaters.	We recommend the use of settling podes to ensure that sediment is dropped out of the water before discharge.	
Fugitive Dust	3.2-115	MJ	Fugitive dust emissions may be caused by vehicle travel on the gravel access roads, and other unpaved areas, as well as activities at the mine site, such as blasting, crushing and grinding of the ore rock, and stack emissions. According to the DEIS, fugitive dust could be measurable as far as ten miles from the mine site, one tenth of a mile from gravel roads. The DEIS includes evaluation of fugitive dust from the mine site and transportation facilities, but no evaluation of fugitive dust associated with pipeline construction, such as the gravel access roads, pipeline trenching and burial, and gravel source sites. We recommend the EIS include analysis of fugitive dust emissions from the construction and operations of the natural gas pipeline. Fugitive dust has the potential to deposit and collect on vegetation, wetlands, and other surfaces. Soils with the highest organic content have been shown to exhibit the greatest potential for metal accumulation. We recommend that the EIS discuss the potential exposure to contaminants resulting from fugitive dust emissions and evaluate potential pathways for bioaccumulation. The EIS should evaluate the potential for biotic transfer from dust-affected soils and vegetation to humans and wildlife. The DEIS indicates that unpaved gravel roads are assumed to be controlled at 90 percent, primarily with periodic chemical		

			application and watering. However, if the gravel source material is tested to contain of high volumes of PAG, then watering to reduce fugitive dust emissions may not be an acceptable management practice as it could result in the generation of ARD/ML to adjacent wetlands, surface and ground waters. We recommend the EIS evaluate other options for minimizing fugitive dust from gravel roads and pads, such as capping the surface of gravel roads and pads with an inert material or applying a non-toxic chemical treatment. As part of Red Dog Mine operations near Kivalina, Alaska, a Fugitive Dust Management, Testing, and Monitoring Plan has been developed and implemented to evaluate fugitive dust emissions and their impacts. We recommend that a similar plan be developed for the Donlin Gold Project to evaluate fugitive dust emissions and their distribution to soils, air, water, vegetation, and the potential exposure of contaminants, such as mercury, arsenic, ARD/ML, to humans and wildlife. The objectives of the study would be to: compile and summarize information pertinent to the fugitive dust issue, present a preliminary conceptual site model describing sources and transport mechanisms for fugitive dust, potential exposure pathways, and human and ecological receptors; identify where additional data collection is needed (data gaps); and outline a decision-making framework for addressing future fugitive dust issues. We also recommend that the HIA determine acceptable exposure concentrations and limits, and pathways for humans and wildlife to bio-accumulate contaminants from ingesting foods exposed to fugitive dust. A Fugitive Dust Control Plan should be completed for the EIS to include design features, mitigation measures, and monitoring of fugitive dust emissions and exposure during the active mine life and post closure.	
3.3 Geohazards and Seismic Conditions					
3.3 Synopsis	3	cg	and from slope stability issues along the 3 times longer road, and at 3 times as many material sites, as Alternative 2.	The road is only 1.5 times longer	
3.3.3.2	3.3-37	MJ		What is the range in seismic/earthquake magnitude that the TSF dam is designed and constructed to withstand? Can this be expressed as a Richter Scale magnitude for public understanding?	
Table 3.3-2	3.3-42	MJ		Include the build out dimensions for the Tailings Dam.	
3.3.3.2.3	3.3-62	MJ	Use of evaporators in TSF pond to reduce water volume	Are evaporators effective in the winter season? Please clarify any season restrictions on the use of evaporators.	
3.4 Climate and Meteorology					
No Comments					
3.5 Surface Water Hydrology					

General Comments					
		LE	This section does a good job of summarizing and illustrating percent flow reductions that result from the project. However, when discussing the magnitude of effects, comparisons are made to historical variation, without reference to its basis.	What is the source of the estimates of historical variation?	
Water Sources and Volumes		MJ	The Donlin Gold Project would require substantial volumes of water for the construction of permanent and temporary gravel facility pads, gravel and ice roads, hydrostatic testing of the pipeline, and other mine related activities. We recommend that the EIS evaluate the project water resource requirements for all of the action alternatives, not just the Proposed Action. We recommend that the EIS evaluate the year round water use resources, locations, and volumes. For each type of water resource (river, stream, lake, pond – permanent, intermittent, ephemeral, perennial), there should be a description in a table of the maximum and minimum surface area, depths and width of the water resource, available water volumes, volume of proposed withdrawal, winter and/or summer withdrawal, presence/absence of resident and/or anadromous fish species. The EIS should describe measures, such as screening, that would be implement to minimize impacts to fish. Additional mitigation measures should include establishing water withdrawal rates, timing of water withdrawal to avoid fish migration, spawning, and incubating eggs. The location of water resources should be included on a map and/or aerial photograph. This additional information is need to adequately evaluate the direct, indirect and cumulative impacts to the aquatic resources and should not be deferred until the permitting process.		
3.5 - Synopsis	3	cg	would reduce the distance traveled by barge by 69 river miles,	Alt 2 description on page 2-43 says it is 199 river miles from Bethel to Jungjuk while page 2-152 says it is 124 miles from Bethel to BTC. That difference is 75 miles. Also, section 3.23 says the reduction is 75 miles	
3.5 - Synopsis	3	cg	crossing 43 streams, as opposed to 40 under Alternative 2.	Chapter 2, page 2-157 says that BTC will have 40 crossings with 8 bridges and 32 culverts while Alt 2 (page 2-53) will have 51 crossings with 6 bridges and 45 culverts Section 3.5.2.2.2 says that BTC would cross 40 while Section 3.5.2.2.1 says Alt 2 would cross 51	
3.5.2.1.2	9	KW	The flow regime of streams in the proposed Project Area includes both ephemeral and perennial systems.	Where in the surface hydrology section are streams classified or functionally assessed? This is a necessary component within this section. Minimally there should be a breakdown of perennial, intermittent, and ephemeral stream systems by linear footage and a discussion on the functions each of those systems provide (i.e. transporting water to the channel, transporting water in the channel, transporting wood and	

				sediment to create habitat, temp and oxygen regulation, processing organic matter, providing for biodiversity). Minimally, stream dimensions should be measured and recorded considering any stream mitigation would be stream relocation rather than restoration. In fish and aquatic habitat stream flow changes are examined minimally and mostly loss of habitat and effect on fish but nothing that would help in determining appropriate mitigation.	
3.5.2.1.2	10	cg	**Notes:** 1 Streamflow data have continued to be gathered by Donlin Gold at these stations beyond 2011. Source: BGC (2012a).	It's 2016. Couldn't these dates have been updated to at least 2015 (when the draft came out)? And if it's because the source doc came out in 2011, then why is Crevice Creek noted with a 1 but the last date listed is 2010?	
3.5.2.2.3	41	cg	Storm surge1	Storm surge[1]	
3.5.2.3.1	54	cg	diesel pipeline would start at the Tyonek Port, located approximately 18 miles southwest of MP 0 of the natural gas pipeline route. From MP 0, the diesel pipeline would follow the same corridor as the natural gas pipeline. Along the 19-mile section between Tyonek and MP 0, the	Section 2.3.4 says 19 miles (page 2-145)	
3.5.3	59	KW	This section describes the temporary and permanent activities associated with construction, and operations and maintenance of the Donlin Gold Project, and the direct and indirect potential impacts of the proposed project on surface water.	Where in the surface hydrology section are streams classified or functionally assessed? This is a necessary component within this section. Minimally there should be a breakdown of perennial, intermittent, and ephemeral stream systems by linear footage and a discussion on the functions each of those systems provide (i.e. transporting water to the channel, transporting water in the channel, transporting wood and sediment to create habitat, temp and oxygen regulation, processing organic matter, providing for biodiversity). Minimally, stream dimensions should be measured and recorded considering any stream mitigation would be stream relocation rather than restoration. In fish and aquatic habitat stream flow changes are examined minimally and mostly loss of habitat and effect on fish but nothing that would help in determining appropriate mitigation.	
3.5.3.2.1	62	KW	Water withdrawal would be permitted and would therefore meet the requirements of ADF&G and ADNR for	Water withdrawal would need to be permitted and would	

			a water withdrawal permit.	therefore have to meet the requirements…..	
3.5.3.2.1	64	cg	This figure will be replaced with a higher quality version in the next draft.	Should "next draft" have been "final"? This sentence should be delete in the EIS	
3.5.3.2.1	66	cg	a volume sufficient to store runoff from a 100-year snowmelt event (Table 3.5-25).	If this were a rain on snow event rather than snowmelt alone, would it affect the required volume?	
3.5.3.2.1	67	KW	Surface water diversion and storage, and interception of surface and groundwater by the mine pit and pit dewatering within the American Creek watershed during the construction phase, would result in a reduction in watershed yield and subsequent discharge to Crooked Creek that is likely to exceed historic seasonal variation, and represents a substantial change in the American Creek flow system.	Specify the percent of watershed yield. "would result in a reduction in watershed yield by X%..."	
3.5.3.2.1	70	cg	During runoff events equal to or less than the runoff produced by a 10-year 24-hour precipitation event, no water would be released from the detention structures until adequate settling and suitable water quality criteria are met.	Should "suitable" be "applicable"? If not, how are "suitable" criteria determined? Also, will monitoring required to verify this assumption?	
3.5.3.2.1	73	cg	to Crooked Creek;Contact water	to Crooked Creek; Contact water	
3.5.3.2.1	75	LE	"… cover consisting of a 13.8 inch layer…"	A tenth of an inch is a very precise measure for a layer of material to be placed by heavy equipment. Clarify.	
North and South Diversion Channels	3.5-77	Bt	To minimize erosion of the valley slopes, flow from the north diversion channel would be conveyed through either a High Density Polyethylene pipe, half-pipe, or armored channel.	The diversion channel should be mitigated at project closure into a functioning stream. Please use this channel as an opportunity to mitigate some of the stream impacts to ensure a functioning stream remains after project closure.	
3.5.3.2.1	78	KW	The impact on stream flow will continue throughout mine operation but will be eliminated after reclamation of the mine and natural streamflow in Snow Gulch is restored; thus, the duration of the impact is expected to be long-term.	Considering stream re-creation science is still relatively new and evolving and never been done on this scale and in this type of post mining landscape which will undergo extreme hydrologic and geologic structure changes, it would suggest that the duration of the impact is expected to be long-term to permanent. Please revise or provide additional justification for not making the change.	

Effects on Crooked Creek	3.5-83	Bt	If the hydraulic conductivity of the bedrock aquifer is as anticipated…Thus, the magnitude of direct and indirect impacts is anticipated to range from low to medium, but would likely be up to a high magnitude in winter or if a high hydraulic conductivity conditions exist.	What are the mitigation options for a high conductivity scenario? How will the effects be minimized? Please provide a reference to the mitigation scenarios if conditions are not as modelled.	
3.5.3.2.1	85	KW	However, there would be no additional mitigation measures to adjust Crooked Creek to its altered flow regime given that the magnitude of impacts to the channel is anticipated to be low.	~~However~~, there would be no additional mitigation measures to adjust Crooked Creek to its altered flow regime given that the magnitude of impacts to the channel is anticipated to be low; however if monitoring indicates higher stream flow changes and channel dimensions impacts that are outside the natural variability or greater than anticipated, mitigation measures would be employed. While the impacts may be low, the duration will be permanent.	
Effects on Crooked Creek	3.5-85	Bt	The results of the computations are presented in table 3.5-27 and indicate that the maximum likely change in the channel dimensions is as follows:	How will these numbers change in the case of higher conductivity as discussed above? How will greater than anticipated rock characteristics change the modeling results? What mitigation is planned in the case of greater reductions in stream base flows, and how much of a change in the aquifer characteristics would result in medium or high impact?	
		Bt	Release of treated water from the water treatment plant during the winter months was considered; however it was determined that water would be needed for process water during the low flow winter months. Water management strategies related to the release of treated water take into account the need to avoid buildup of excess water, improved water treatment, and mitigate stream flow reductions.	This statement implies that during the winter months there will be no mitigation of stream flow reductions. The lack of flow mitigation would probably lead to drastic changes in the character of Crooked Creek, potentially resulting in little to no flow, and the potential for the complete freeze-up of the creek during the low flow period. This change would have dramatic effects on stream life. Please describe how flow mitigation will be done during the winter months.	
3.5.3.2.1	85	cg	as well as changes aquatic and fish habitat	as well as changes to aquatic and fish habitat	
Closure, Reclamation, and Monitoring	3.5-86	Bt	The lower CWD would be breached, the liner and fill material would be removed, and to the maximum extent practical, the surface would be restored to its pre-mining condition.	Donlin should consider this area as a possible mitigation site.	
		Bt	The upper CWD liner would be removed, and the impoundment would be filled with waste rock, graded, and	Ensure that no PAG rock is used to fill the CWD. The area should be considered as a potential mitigation site and be	

			reclaimed as part of the WRF reclamation.	mitigated rather than reclaimed.	
		Bt	The Ore Stockpile Berm and sump would be regraded and, to the maximum extent possible, restored to its pre-mining condition.	The site should be considered as a mitigation opportunity.	
	3.5-88	Bt	Put another way, the storage volume available from the PMP 24-hour precipitation, plus the runoff from the 100-year annual wet year plus the runoff from 3 average precipitation years, assuming the pumping is not restored.	Regardless, Donlin should employ the best available monitoring technology available to monitor the pit lake levels. The monitoring technology should be revisited periodically through perpetuity.	
		Bt	The TSF would be covered with non-metal leaching/non-potentially acid generating rockfill material to provide a capillary break.	Please provide the design permeability of the cap. How will breaching of the cap by vegetation or animals be prevented and monitored for?	
3.5.3.2.1	88	cg	Once the discharges from the pit begin, Crooked Creek flows will continue to be reduced from the pre-mining condition, but will be less reduced than during mining	Once the discharges from the pit begin, Crooked Creek flows will continue to be reduced from the pre-mining condition, but the reduction will be less than during mining	
3.5.2.3.1	89	LE	"... surface settlement of the closure cap will have an effect on surface grading and stormwater management, and the overall integrity of the closure cap."	Either explain briefly how those effects of settling will be managed or point to where that explanation can be found.	
3.5.3.2.1	95	cg	and the AWT would only be operated during the summer months	AWT or just WTP? AWT is not previously used.	
3.5.3.2.2	96	cg	The road would be approximately 30 miles long and cross 50 streams and drainages requiring structures to convey surface water flow (Table 1, Appendix G). Five stream crossings would require bridges	The description of Alternative 2 in Chapter 2 says there will be 51 stream crossings with 6 bridges (page 2-53)	
3.5.3.2.2	97	KW	After the pit lake achieves its maximum managed stage, the amount of leakage from Crooked Creek would be a small percentage of the overall flow in the creek, and the magnitude of the effects would be considered low.	What is the maximum managed stage? What is the specific percentage of leakage?	
	3.5-101	Bt	The bulkhead would alter flow in the river as the current deflects around the structure, potentially resulting in increased erosion and deposition at either end.	Will Donlin be monitoring for erosion at the port? While Donlin is installing BMPs for erosion prevention, they should also actively monitor for erosion in order to do adaptive management if erosion is detected.	
3.5.3.2.2	101	cg	Since the port will be used for the life of the mine and then	In another part of the document, it states that a barge landing	

			removed, the duration of the impact is expected to be long-term.	will remain but all other port facilities would be removed. Should this say that too?	
3.5.3.2.2	102	cg	From Bethel, both cargo and fuel would be transported upriver approximately 168 river miles to Angyaruaq (Jungjuk) Port by river barge . . . River. There are a total of eight critical sections along the river extending for 199 river miles between Bethel and Angyaruaq (Jungjuk)	Alt 2 description on page 2-43 says it is 199 river miles from Bethel to Jungjuk	
3.5.3.2.2	106	cg	For typical tugs currently operating on the river (twin or triple screw, 375 to 400 hp per propeller (Fernandez 2014d), maximum riverbed velocities would be about 1 to 2 feet/second less than that of the proposed tugs in shallow water depths.	The first parenthesis does not have a corresponding closing one	
3.5.3.2.2	107	cg	Results are depicted on for a stationary tug after	Results are depicted for a stationary tug after	
3.5.3.2.2	107	cg	The results in show a	The results show a	
	110	cg	The scour results on also apply to	The scour results also apply to	
Ports	3.5-115	Bt	The area around the barge landing sheet pile wall and the port site would be recontoured and revegetated to restore pre-project functions and values to the maximum extent practicable.	Donlin should consider the site as a potential mitigation site rather than just as a site to restore.	
3.5.3.2.3	116	cg	the 50-foot wide permanent ROW.	Section 2.3.2.3.1 says "50 feet wide on ANCSA and State of Alaska lands and 51 feet, 2 inches on BLM-managed lands" so will it all be only 50 feet?	
	3.5-120	Bt	However, it is reasonable to assume that collection of additional data and contingency planning would take place in final design in support of winter weather water use permitting.	This data should be available to the agencies in order to help assess cumulative impacts from winter water use impacts. This data should be collected and made available prior to issuance of a ROD or permit for this project.	
	3.5-122	Bt	It is reasonable to assume that additional winter water extraction data collection would occur in final design, and that the rate and volume of water withdrawals would be monitored at each source to ensure permit requirements are met. Thus, the magnitude of the impacts to water resources is generally expected to be low.	This data should be available to the agencies in order to help assess cumulative impacts from winter water use impacts. This data should be collected and made available prior to issuance of a ROD or permit for this project.	

3.5.3.2.3	123	cg	pads for pipe storage yards, and other	pads for PSYs, and other	
3.5.3.2.5	128	KW	Additional mitigation measures related to surface water hydrology include the following:	The discussion of mitigation that follows is specific to wetlands. We recommend you include specific language and discussion in this section regarding the mitigation of stream and rivers on site – specific measures to be implemented. Overall, the discussion of mitigation for streams in this section is deficient compared to the level of detail included in the wetlands section in 3.11. Additional detail is needed regarding stream mitigation that is on par with the level of detail included in the wetlands section.	
3.5.3.2.5	128	cg	Details would be developed as Donlin Gold's Conceptual Compensatory Mitigation Plan is developed	Details will be included in Donlin Gold's Conceptual Compensatory Mitigation Plan	
3.5.3.2.5	128	LE	The Corps "is considering additional monitoring and adaptive management" including the following: "The groundwater flow model should be reexamined 3 years after the commencement of pit dewatering to minimize uncertainty about dewatering effects, with a 5-year review frequency thereafter, or when noteworthy unexpected conditions are encountered. Unexpected conditions should be used to revise projections and adjust management plans as needed. As required by permit conditions, relevant groundwater data (such as production rates and water table levels) should be collected as mining progresses to facilitate model revisions;	EPA strongly encourages the re-examination and revision of the ground water model as described in this bullet.	
3.5.3.4.2	134	cg	transmission line corridor for approximately 18 miles from the Tyonek area to MP 0	Section 2.3.4 says 19 miles(page 2-145)	
3.5.3.4.3	136	cg	traverse an additional 18 miles to reach MP 0	Section 2.3.4 says 19 miles (page 2-145) and the next paragraph says 19 miles	
3.5.3.5.2	137	cg	would be located at BTC, approximately 69 river miles downstream from the Angyaruaq (Jungjuk) Port	Chapter 2 (Section 2.3.5) and Section 3.23 (Transportation) says the reduction is 75 miles.	
3.5.3.5.2	137	cg	the BTC Road indicates that the road would cross 43 streams; of these, 8 would require bridges and 35 would require culverts (compared to 40 streams, 6 bridges, and	Chapter 2, page 2-157 says that BTC will have 40 crossings with 8 bridges and 32 culverts while Alt 2 (page 2-53) will have 51 crossings with 6 bridges and 45 culverts	

			34 culverts under Alternative 2)		
3.5.3.6.1 Option 1: Unlined Dry Stack	3.5-139	Bt	The following is a summary of the requirements for the unlined dry stack TSF…	Since the dry stack option 1 will be unlined, groundwater monitoring should be included in the requirements.	
	3.5-141	Bt	It is estimated that it would take roughly 200 years for seepage flow to reach the same rate as that predicted for the TSF under Alternative 2.	Donlin should be required to incorporate long-term monitoring to ensure groundwater contamination is detected as soon as possible. Monitoring should be done in real-time using the best technology available at the time. The technology should be reviewed periodically through perpetuity.	
3.5.3.6.1	141	cg	inflows to the SRS from the rock drain system would average 709 gpm per year,	What does 709 gallons per minute per year mean? Is it the average flow over the year? If so, is it a particular year that it had to be pointed out?	
3.5.3.7	154	cg	The pipeline route under Alternative 6A would cross a total of 377 streams and drainages, compared to 400 streams and drainages crossed along the Jones River (preferred) route under Alternative 2.	Should "preferred" be "proposed" since Alternative 2 is the applicants proposal and there is no mention in the draft of the Corps preferred alternative or the environmentally preferred alternative	
3.5.3.7.1	155	cg	for Alternative 2.The effects	for Alternative 2. The effects	
Table 3.5-35	157	cg	30-mile mine access road, 40 streams, 6 bridges, and 34 culverts	Chapter 2 (page 2-53) says 51 crossings with 6 bridges and 45 culverts	
Table 3.5-35	157	cg	76-mile mine access road, 43 streams, 8 bridges, 35 culverts	Chapter 2 (page 2-157) says 40 crossings with 8 bridges and 32 culverts	
3.6 Ground Water Hydrology					
General Comments					
Mine Pit Dewatering		MJ	During mine operations, the dewatering of the open pit mine using groundwater wells would result in a cone of depression that would lower the water table approximately 1,500-ft near the center of the pit over a surface area of 16-mi^2. This cone of depression would result in long-term direct, indirect, and cumulative impacts to surface and subsurface groundwater, including wetlands. Approximately 541 acres of wetlands adjacent to Crooked Creek could be affected by mine pit dewatering. The DEIS indicates that mine pit dewatering would reduce stream flow in Crooked Creek by 24 to 67 percent in the winter,		

		and 9 to 20 percent in the summer. The DEIS indicates that during winter months, there would be no enhancements to augment stream flow in Crooked Creek. The lack of stream flow would probably lead to serious changes in the character of Crooked Creek, potentially resulting in little to no flow, and the complete freeze up of the creek during the low flow period, which may have serious effects on stream life. We have concerns regarding impacts to fish rearing, migration, and spawning habitat, as well as potential incubating eggs in the gravel beds.	
Monitoring and Replenishing Crooked Creek		We recommend that the EIS consider real time flow monitoring with discharge points above and below the influence of the cone of depression. By monitoring flows above and below the cone of depression, water augmentation could be directed to ensure that low flows of Crooked Creek would be mitigated where it is needed. Augmentation could increase flows through the zone to prevent adverse impacts from low flows in Crooked Creek. We recommend the EIS evaluate advanced water treatment to treat the groundwater from the mine pit dewatering and to discharge the treated water in Crooked Creek further downstream from the influences of the cone of depression to augment the reduction and elimination of groundwater and surface water. The EIS should include a Mine Pit Dewatering Monitoring Plan to ensure that flow reductions to Crooked Creek are being monitored in real time as the pit is being developed, and design features, mitigation measures, and advanced water treatment are appropriate and adequately implemented to minimize impacts.	
Pit Lake Wetland Impacts	MJ	At the end of the active mine life, surface and ground waters that would replenish Crooked Creek and adjacent wetlands would be diverted into the open pit mine to create the pit lake. The DEIS indicates that after the pit lake fills with water, a new equilibrium groundwater level would become established. Because the pit lake level would be below the elevation of Crooked Creek, the section of the creek that runs along the pit lake would lose groundwater to the cone of depression created by the pit lake. This could result in long-term wetland and stream flow effects. Groundwater modelling results show that the pit lake would continue to be a destination for groundwater flow and that Crooked Creek would continue to lose water to the groundwater systems flowing to the pit because of ongoing pumping and treating of the lake water to keep levels below surrounding water levels. We recommend that the long-term impacts to wetlands and Crooked Creek resulting from groundwater migrating toward the pit lake be evaluated in the EIS. Compensatory mitigation should be proposed in the CMP and the EIS to offset the indirect impacts and temporal loss of wetlands adjacent to Crooked Creek. The DEIS suggests that maintaining the pit lake at an elevation 10 meters below the invert level is intended to prevent direct discharge of pit lake water into surface waters (Crooked Creek). Particularly during the winter months and dry periods, groundwater flows out of aquifer storage into Crooked Creek, which constitutes the majority of stream flows. In the worst case scenario, significant groundwater contamination could occur prior to the pit lake start of pumping. The DEIS does not suggest that the pit lake would be maintained as a hydraulic sink. Therefore, discharge from the pit lake via groundwater could occur, resulting in both transport of pit lake contaminants into groundwater, but also in potential leaching and mobilization of contaminants, such as mercury and arsenic, in the surrounding pit wall rock via groundwater, and discharge into surface water via down gradient groundwater discharging into surface water.	
Pit Lake Contaminants		We recommend that the EIS discuss the modeling results and the conclusions made regarding groundwater contaminants not migrating away from the pit. The range of hydraulic conductivities (Table 3.6-2) are fairly wide, and indicate that	

Modelling		contamination could migrate up to 14-feet per day during the 52-year filling period of the pit lake. Even in the lower aquifer depths, the contaminants could migrate up to 0.2-feet per day. While it is important to assume a uniform conductivity for modelling purposes, using a relatively low geometric mean could potentially underestimate contaminant movement during the pit lake filling period, and potentially during the mine operations period. We recommend additional modelling and analysis of the hydraulic gradient of the pit lake to determine the potential for the transport and migration of contaminants, such as mercury and arsenic, into groundwater discharging into Crooked Creek and adjacent wetlands. In particular, it is important to evaluate the rate and area of groundwater migration during the period when the pit lake is filling. A greater pumping and advanced water treatment rate may be necessary prior to discharging into Crooked Creek. We recommend using a worst-case and projected hydraulic conductivities multiple times during post-closure to determine the maximum contamination of the bedrock aquifers so that mitigation measures can be proposed and implemented in case of groundwater contamination.	
Pit Lake Groundwater Sampling and Monitoring Plan	MJ	A Pit Lake Groundwater Sampling and Monitoring Plan should be developed to focus on long-term water quality monitoring, sampling, and testing of the groundwater around the pit for the presence, abundance, and migration of contaminants, such as mercury and arsenic. Groundwater monitoring should be done in real-time with the best available technology. The best available technology should be reviewed periodically throughout the monitoring period. Monitoring should continue until the model is confirmed that the water is flowing back toward the pit and no further contamination is present in groundwater. If groundwater contamination is found to be migrating away from the pit, then mitigation measures should be in place to remediate the contaminated groundwater as soon as possible to prevent the spread of contamination. Advanced water treatment of groundwater may be required to ensure that surface water meets water quality standards.	
Waste Rock Facility	MJ	The DEIS indicates that the groundwater from the WRF would have concentrations of several constituents that are predicted to exceed the most stringent AWQS, and therefore adverse impacts to groundwater quality would occur in areas underneath and immediately adjacent to the WRF. As a mitigation measure to prevent groundwater contamination in the area, we recommend lining the WRF and other mine facilities, such as the contact water ponds, which have the potential to contaminate groundwater. The groundwater quality should be monitored in real-time for the life of the facility using the best available technology at the time to detect any potential contamination resulting from leachates generated from the WRF. Any potential contamination detected should be mitigated and contained. The technology should be reviewed periodically for the life of the facility (i.e. in perpetuity).	
Tailing Storage Facility	MJ	The TSF and dam has the potential of contributing to environmental and public health concerns if not properly constructed, maintained, and monitored. For example, a catastrophic event at the Mount Polley Mine in central British Columbia resulted in the breach of the mine tailings impoundment, causing a release of tailings slurry/saturated tailings into the downslope waterbodies.	
Tailings Storage Facility Failure Modes		Any proposal for a subaqueous tailings storage facility requires a hard look and justification. We appreciate that a Failure Modes and Effects Analysis (FMEA) was developed during the DEIS process. We recommend that the FMEA be included in the EIS and that an adaptive management plan resulting from the FMEA process be included to address contingencies	

Effects Analysis			relative to not only tailings dam stability concerns, but other environmental concerns. We recommend that the FMEA process continue to be used by the project proponent and State and Federal regulators to inform the engineering design and mitigation processes as the project continues through the active mine life and post-closure.		
Tailings Storage Facility Wildlife Management Plan			The public raised concerns regarding the potential exposure of birds and wildlife to contaminants from the TSF and the pit lake. We recommend that a Wildlife Management Plan be developed and implemented to prevent birds and/or wildlife from access to the TSF and the pit lake. Wildlife protection measures could include incorporating an enclosed perimeter fence, netting or other non-intrusive barriers. Hazing may also be considered a wildlife management control technique.		
3.6	3.6-2 Expected Effects	bt	During operations, this contact water would be captured by pit dewatering; after closure, it would flow to the pit lake.	It should be clarified that modeling shows that the water would be captured by pit dewatering. Continued monitoring of the hydrology and movement of contaminants should be done to confirm the model results.	
		bt	After mine closure, modeling shows that the pit lake would continue to be a destination for groundwater flow, and that Crooked Creek would continue to lose water to the groundwater system flowing to the pit because of ongoing pumping and treating of lake water to keep water levels below surrounding water levels.	According to §3.6.2.2.1, the pit will fill for approximately 52 years, and during that time approximately 1,000 gpm of water will be flowing into the surrounding bedrock. Even after the pit lake is filled, pumping will only take place 4-5 months per year. In order to prevent groundwater contamination, the WRF should be lined to ensure minimal groundwater contamination from this facility.	
3.6.1.3.3	3.6-12	bt	Detailed examination of the available data has also not revealed any significant correlation between bedrock hydraulic conductivity and rock type or formation.	This issue should be discussed further in regard to the modeling results and the conclusions made regarding groundwater contaminants not migrating away from the pit. The range of hydraulic conductivities provided in table 3.6-2 are fairly large, and indicated that contamination could migrate up to 14 feet per day during the 52-year filling period of the pit lake. Even in the lower aquifer depths the contaminants could migrate up to .2 ft/day. While it is important to assume a uniform conductivity for modelling purposes, using a relatively low geometric mean could potentially drastically underestimate contaminant movement during the pit filling period, and potentially during the mine operations period. We recommend running a worst case scenario to determine the maximum contamination of the bedrock aquifers so that mitigation measures can be proposed in case of significant groundwater contamination.	
Table 3.6-	3.6-12	LE	(Summary of Hydraulic Conductivity Estimates from	It is good to see the ranges presented here alongside the	

2			Hydraulic Tests Not Influenced by Permafrost)	mean, but the table would be more informative if it included the number of measurements used to make up the estimate	
	3.6-12-13	Bt	Locally, both within and surrounding the pit area, zones of hydraulic conductivity higher than regional or local averages (by factors of 10 or more) may be present and could influence local groundwater flow fields and groundwater pumping rates from wells.	Due to the uncertainty regarding hydraulic conductivity, we recommend long-term water quality monitoring to ensure any groundwater contamination is found and mitigated. Water quality monitoring of the groundwater should be done in real-time using the best available technology. The technology should be reviewed and updated periodically for perpetuity.	
	3.6-13 Miine Site Ground water Model	Bt	A three-dimensional mathematical model of the groundwater flow system in the vicinity of the proposed mine site and process facilities has been constructed by BGC in order to accomplish the following primary goals.	The model should also be used to estimate the transport of contaminants to the groundwater due to the WRF and pit using worst-case and projected conductivities. This is especially important to do to estimate the spread of groundwater contamination during the period when the pit lake is filling.	
3.6.1.4.1	3.6-16	LE	"...sensitivity analyses were performed..."	Include reference to where that discussion can be found	
3.6.1.4.1	3.6-19	Bt	Simulation of Aquifer Tests and Stream Leakage	In this section it is stated that the aquifer tests show variable quality matches due to the heterogeneity of the aquifer. We believe this argues for additional monitoring of groundwater contamination in order to assure groundwater contamination is detected and mitigated. While the model used the geometric mean of the conductivities, the aquifer tests show this may not be appropriate.	
Model Calibration and Simulation of Future Conditions		bt	The amount and uncertainty of inaccuracies of these simulations are difficult to gauge... These assessments are subsequently used to justify possible mitigation conditions such as additional data collection and periodic model revision as dewatering of the pit progresses.	These uncertainties require that water quality parameters also should be monitored in order to ensure any groundwater contamination is detected and mitigated. Monitoring should be done with the best available technology at the time, with periodic reviews of the available technology for perpetuity.	
3.6.2.2.1 Contact Water	3.6-24	Bt	Contact water would be likely to enter the groundwater system as seepage from the WRF beneath the construction –stage footprint of the WRF, the lower contact water pond, or as seepage through the lower contact water dam (CWD).	Wherever possible facilities which could potentially lead to groundwater contamination should be lined to minimize the possibility of contamination. Alternately, the groundwater should be monitored for appropriate parameters to detect	

			This water would be captured by the ACMA pit dewatering system or by a proposed ore stockpile berm designed to minimize runoff into the ACMA pit.	groundwater contamination so that the contamination can be mitigated. Monitoring should also be performed to ensure that the groundwater is behaving as modelled.	
Tailings Storage Facility	3.6-31-32	Bt	The purpose of the wells is to 1) monitor the groundwater quality to verify that groundwater does not deteriorate and 2) to create a completely closed flow system to capture any potential leakage from the TSF or SRS pond into the groundwater system if water quality deteriorates.	If groundwater quality begins to deteriorate, Donlin should mitigate the existing contamination and take steps to prevent further contamination of the groundwater.	
	3.6-33	Bt	Calculations suggest that if the SRS pumping system were to go completely off-line, the SRS would likely fill to overflowing and/or lose hydraulic containment with respect to groundwater in approximately two weeks…	Please ensure that real-time monitoring using the best available technology at the time is used to detect pump failure. The technology should be reviewed periodically for the life of the system.	
Waste Rock Facility		Bt	However, the location of the WRF in the surface water and groundwater flow systems that drain into the pit lake create a closed system whereby the effects on groundwater are limited to the immediate vicinity of the WRF and the small area between the WRF and the open pit.	In order to prevent, to the maximum extent practicable, groundwater contamination, all site facilities which may have the potential to contaminate groundwater should be lined. Alternatively, groundwater quality monitoring should be done in real-time using the best available technology at the time. The technology should be reviewed and updated periodically in perpetuity.	
South Overburden (SOB) Stockpile	3.6-34	Bt	Water percolating through the SOB also has the potential to enter groundwater and flow towards Crooked Creek.	In order to prevent, to the maximum extent practicable, groundwater contamination, all site facilities which may have the potential to contaminate groundwater should be lined. Alternatively, groundwater quality monitoring should be done in real-time using the best available technology at the time. The technology should be reviewed and updated periodically for the life of the SOB.	
		Bt	Following removal of the SOB soils, sediment accumulations in the sediment pond should be removed to eliminate a potential source of groundwater contamination.	This site should be considered a possible mitigation site.	
	3.6-35	Bt	During the entire 52-year filling period, water would flow from the pit lake into the dewatered bedrock and waste rock backfill in the pit. The rate of this water flow would be greatest during the first 8 years of pit filling, declining from	According to Table 3.6-2, the highest conductivity is 9 ft/day. At that rate of travel, in 52 years the groundwater contamination could travel a very long distance, and with the maximum flow rate of 2,300 gpm, a lot of contaminated water	

			about 2,300 gpm to about 1,000 gpm. After 8 years and up to when the lake pit fills, the rate of water flowing out of the pit into groundwater would gradually decline from about 1,000 gpm to 0 gpm.	could enter the groundwater system. During the winter months (§3.6.1.3.2) and dry periods, groundwater flows out of aquifer storage and into Crooked Creek. In the case of a worst case scenario, significant groundwater contamination could occur prior to the pit lake start of pumping. Donlin should monitor the groundwater around the pit lake to ensure that contamination does not leave the area of predicted hydraulic containment. Monitoring should be performed in real time using the best available technology available at the time. The technology should be reviewed periodically and updated for perpetuity.	
Tailings Storage Facility	3.6-38	bt	The local diversion of groundwater beneath the TSF through the rock underdrain would continue permanently.	How will this be monitored? If a blockage forms will it cause erosion in the TSF which will eventually undermine the integrity of the TSF?	
3.6.2.2.6	3.6-44 to 45	LE	Additional mitigation and monitoring for Alternative 2	(EPA) would support that list of monitoring and adaptive management approaches to reduce uncertainties around ground water impacts	
3.7 Water Quality					
General Comments					
Baseline Conditions Methyl Mercury		MJ	The DEIS indicates that naturally elevated mercury levels are found sporadically in surface and groundwater and sediments within and surrounding the proposed mine site. Concentrations of mercury in surface and groundwater samples collected from both within and outside of the proposed mine site exceeded the applicable water quality standard. The more harmful form of mercury, methylmercury, is also present in existing sediments. The proposed mining operations could increase methylmercury production and concentrations due to increases in sulfate loading, organic carbon loading, and inorganic mercury loading in area surface waters, including wetlands. Sources of inorganic mercury would be from fugitive dust and stack emissions. We recommend that the EIS discuss the dynamics of mercury (e.g., sources, movement, distribution, transformation, bioaccumulation, etc.) in wetlands, rivers and stream systems, where methylation would be expected to occur mostly in the sediments. The DEIS does not provide information on baseline measurements of methylmercury in water or any of the key constituents associated with methylmercury production, such as sulfate and organic carbon. Without this baseline information, the environmental and human health impacts from mining activities may be difficult to identify. The model used to estimate baseline methylmercury concentrations in water is driven by unrealistically high organic carbon concentrations, and likely over estimates the current baseline methylmercury concentrations in water. As a result, any measured increases in stream	

		methylmercury concentrations due to mine activity may not be apparent. Methylmercury is more readily retained by higher trophic-level organisms than other forms of mercury. We have concerns with the potential bioaccumulation of methylmercury in the food chain, particular in regards to traditional subsistence foods. The accumulation of methylmercury in higher trophic level organisms results mainly from the ingestion of methylmercury-containing food rather than direct uptake of methylmercury from drinking water. We recommend that the EIS include additional modelling of mercury bioaccumulation, sources and pathways for uptake and exposure to methylmercury in the food web. In addition, we recommend long-term monitoring of the human health impacts, food consumption and exposure to methylmercury throughout the active mine life and during post-closure. In addition, we recommend developing this long-term monitoring plan in coordination and involvement with the local native communities.	
Arsenic Management	MJ	The DEIS identifies elevated naturally occurring baseline concentrations of arsenic in soils, sediments and surface waters in the vicinity of the proposed mine site, which is common for gold-bearing areas. Concentrations of arsenic in surface and groundwater samples collected from both within and outside of the proposed mine site exceeded the applicable water quality standard. We recommend that the EIS identify the sources of arsenic from mine operations and discuss how those sources may potentially increase existing baseline arsenic concentrations during the active mine life and post-closure. We recommend that the EIS provide a comparison of baseline arsenic concentration levels in soils, sediments, surface water and groundwater to other mineralized and non-mineralized areas of Alaska. An Arsenic Management and Monitoring Plan should be developed and implemented to ensure that the project does not exacerbate standards exceedances for arsenic in surface and groundwater, and ensure acceptable human health exposure limits during project construction, mine processing operations, mine pit dewatering, pit lake recharging, and prior to discharging into surface waters, such as Crooked Creek. The EIS should identify the specific water treatment processes to remove arsenic from surface and ground waters on the mine site.	
Acid Rock Drainaing/Metal Leaching	MJ	Geochemical characterization at the mine site was conducted to determine the extent of acid rock drainage/metal leaching (ARD/ML). We have concerns regarding the WRF and potential for ARD/ML during the operations phase, and prior to placement of a final cap. If the non-acid generating (NAG) and potentially acid generating (PAG) waste rock are not be adequately mixed during placement in the WRF, then it may begin to produce higher-concentrations of acidic seepage by the end of the mine life for year 26. We recommend that a liner be incorporated into the design of the WRF to minimize migration of contaminants into groundwater. The WRF should be monitored to ensure no ARD/ML migrates into groundwater. Water quality predictions indicate arsenic has the potential to be leached from waste rock under both acidic and non-acidic conditions. According to the DEIS, arsenic leaching is a potentially significant concern for almost all waste rock due to widespread elevated concentrations in the rock and high leachability, as indicated by the test work. The EIS should clarify that the purpose of performing waste rock geochemical characterization is to manage potential ARD/ML, but it should not eliminate the need for water treatment, including advanced water treatment of arsenic. We recommend a plan to address ARD/ML from the WRF and to include additional monitoring and testing of the groundwater for potential leaching of contaminants.	

			We recommend that the EIS include geochemical characterization of potential new and existing gravel material source sites that would be used to construct the mine access road from the Jungjuk Port, air strips, access roads for pipeline construction and facility gravel pads. This characterization is needed to determine the volume of PAG rock material and to identify specific design features, mitigation measures, and BMP to minimize potential ARD/ML to adjacent surface waters, including wetlands. If the gravel source material is found to consist of PAG material and/or have elevated mercury and arsenic concentrations, then the fill material may be considered unsuitable fill material under the CWA Section 404(b)(1) guidelines requirements and not suitable for discharge into wetlands and other surface waters.		
3.7 - Synopsis	1	cg	But the department does not regulate groundwater directly.	Does this mean that the Department does not try to change the quality of the groundwater as it might surface water (through TMDLs) or is it saying it does not regulate the quality of the discharges to groundwater? The latter is not true since permits under 18 AAC 72 or 18 AAC 83 would be necessary to discharge to groundwater.	
3.7- Synopsis	2	CE	However, there are points along the Kuskokwim, usually at confluences with tributaries that drain mineralized areas, where concentrations of mercury and other minerals are elevated.	The term "elevated" should be defined. The text should indicate if these concentrations were statistically different from other locations.	
3.7 – Synopsis	2	cg	where iron has sometimes exceeded drinking water standard	Either "where iron has sometimes exceeded the drinking water standard" or "where iron has sometimes exceeded drinking water standards"	
3.7 – Synopsis	3	cg	would reduce the distance traveled by barge by 69 river miles,	page E16, E498 and Table 3.5-35 say that the difference is 75 miles (199 - 124) not 69	
3.7 – Synopsis	3	CE	Impacts to sediment quality in Crooked Creek, and increases in mercury and methylmercury concentrations in sediments, would be of low intensity, within the range of natural variation, and would be expected to decline in post-closure.	Potential impacts to methylmercury concentrations in water should be included.	
3.7.1.1	5	cg	Alaska Pollution Discharge Elimination System permits	Alaska Pollutant Discharge Elimination System permits	
3.7.1.1	5	cg	Under Sections 301 and 502 of the CWA, any discharge of dredged or fill materials into waters of the U.S., including wetlands, is forbidden unless authorized by a permit issued by the Corps pursuant to Section 404.	CWA § 502 is the general definitions section of the Act so doesn't necessarily forbid anything	
3.7.1.2.2	7				

		cg	But the department does not regulate groundwater directly.	See comment on synopsis above	
3.7.1.2.2	7	cg	It should be noted that the EPA Maximum Contaminant Level (MCLs) for Aluminum, Chloride, Copper, Fluoride, Iron, Manganese, pH, Silver, Sulfate, TDS, and Zinc are Secondary Drinking Water Regulations that set non-mandatory water quality standards.	Copper and Fluoride also have primary MCLs	
3.7.2.1.1	30	CE	Figure 3.7-2	The figure is representative of mercury dynamics in a stratified lake; however there is no mention of processes occurring in the sediment. The area of interest for the Donlin gold project does not include lakes, but is more dominated by river systems. As such, The focus should be more on dynamics in riverine systems, where methylation would be expected to occur mostly in the sediment. This would also apply to lakes as well, where methylation is thought to be highest in the sediment.	
3.7.2.1.1	36	cg	Category 1 and Category 3 waters (Table 3.7-2 through Table 3.7-4.	Category 1 and Category 3 waters (Table 3.7-2 through Table 3.7-4).	
3.7.2.1.1	40	cg	Dissolved-iron concentrations	Dissolved iron concentrations – here and elsewhere in the paragraph, see Mn below	
3.7.2.1.1	41	cg	Table 3.7-7	There are shaded cells in this table that appear to indicate WQ exceedances but there is nothing in the footnotes or the text that says that is what the shading means	
3.7.2.4	75	cg	As stated on the Alaska Department of Natural Resources (ADNR) website: “Mining 101 – rock chemistry drives water quality and mine design.”	Is a power point presentation a reliable reference?	
3.7.2.4	76	cg	In some mineralized deposits, rock type alone can be a good indicator of whether a rock will potentially produce ARD and/or ML. However, gold mineralization at the proposed mine site occurs mainly within the sulfide minerals pyrite	The “However” seems unnecessary	
	3.7-79	Bt	The block model mentioned in Section 3.7.2.4 was used in combination with the geochemical and mineralogical	This approach does is misleading since much of the ARD will occur after mining is complete. While many of the studies	

			studies to estimate ARD potential during each proposed mining year.	indicated that ARD would occur after "several decades", that is a small timeframe when compared to perpetuity. Donlin should discuss ARD development well beyond the closing of the mine.	
	3.7-82	Bt	Table 3.7-16, PAG 5, PAG but with very long delays (several decades) to onset of ARD.	This statement is misleading when compared to the timeframe that the PAG waste rock will be in place. The waste rock will remain exposed to the elements in perpetuity, which is the timeframe Donlin should be considering when designing waste rock facilities. Even with the designed cap being considered, in the long time frame the cover will be breached by wildlife and vegetation leading to exposure to the elements and acid drainage. How will Donlin monitor and maintain the cap for perpetuity?	
	3.7-83	Bt	The pH has started to decrease in another sample (shale sample 683340, PAG 5), but is still neutral.	The sample is showing a trend toward acidity, how long is the projected timeframe to when the leachate becomes acidic? Is that timeframe within the life of the WRF?	
		Bt	This correlation allowed estimates of the delay to acid formation for various classes of PAG rock, as given in Table 3.7-16 – from less than a few years for PAG 7 rocks to several decades for PAG 5 rocks.	Since the life of the mine operations is approximately "several decades", all PAG rocks should be disposed of in a lined facility. Since the WRF will remain in perpetuity, any PAG rock should be expected to create ARD during the lifetime of the WRF.	
3.7.2.4.1	83	cg	began producing acidic leachate after more than 200 weeks.	began producing acidic leachate after 200 weeks. – the inclusion of "more than" is redundant with "after"	
	3.7-88	Bt	However, most barrels show a decrease of pH over time and there appears to be a seasonal pattern with a pH minimum in late summer in all cases (Figure 3.7-18).	Extrapolate the results out to several decades (or longer) to estimate acid generation due to PAG rock.	
	3.7-88	LE	(barrel tests): "… included two composite sediment… samples"	Although it is clarified later, this reads as if sediment samples were included in barrel tests rather than samples of sedimentary lithologies	
	Figure 3.7-18	Bt	Barrel Test Leachate pH	Include best fit lines to show the change in pH over time.	
	3.7-96	Bt	The HCT and barrel test results corroborated the MWMP results and indicated that arsenic has the potential to be	How will the arsenic leachate be controlled from being released to the environment in the long-term?	

			leached at both acid and neutral-to-basic pH values, even from NAG rocks (Figure 3.7-21)		
3.7.2.4.4	104	cg	Phase 1 (Day 2013).The tails from	Phase 1 (Day 2013). The tails from	
3.7.2.4.4	107	cg	Table 3.7-27	Why is mercury not included in the Table?	
3.7.2.4.4	107	cg	Selenium µg/L 4.6	If this criterion is to be used for CWA purposed, it should be 5	
3.7.2.4.4	107	cg	Criteria are expressed in terms of dissolved metal in the water column, except for aluminum and mercury, which are in terms of total recoverable metal	Mercury is not in this table.	
3.7.2.4.4	107	cg	A hardness of 400 mg/L was used for all calculations.	Why? There is no explanation as to why 400 is the proper value to use	
3.7.2.4.4	109	cg	AWQC	Applicable Water Quality Criteria (AWQC) – not previously short cited in Chapter 3	
3.7.2.4.4	109	cg	Criteria are expressed in terms of dissolved metal in the water column, except for aluminum and mercury, which are in terms of total recoverable metal	Neither aluminum nor mercury are in this table.	
3.7.2.4.4	110	cg	Table 3.7-29 - Lead µg/L 11	Table 3.7-27 lists this criterion as 10.9 – be consistent	
3.7.2.4.4	111	cg	A hardness of 400 mg/L was used for all calculations	There is no explanation as to why 400 is the proper value to use	
3.7.3.2.1	113	cg	Applicable Water Quality Criteria (AWQC)	Previously used but not previously short cited	
	3.7-114	Bt	However, if the NAG and PAG5 rocks are not well mixed, the NAG WRF will begin to produce higher-concentration, more acidic seepage by the end of the mine life, based on the predictions in SRK 92007) for year 26.	How will Donlin ensure adequate mixing of the NAG and PAG rocks? We recommend that the WRF be lined in order to minimize the potential contamination of the groundwater by acid mine drainage.	
3.7.3.2.1	114	cg	Peak runoff is limited to the spring and summer months, with negligible runoff volumes between mid-October and the beginning of April. These variable flows are in contrast to the constant fresh water demand . . . be a useful source of fresh water during the fall and winter, when inflows are minimal	Isn't the 2nd highlight phrase just a repeat of the first?	
3.7.3.2.1	114	cg	2015f).This water	2015f). This water	

3.7.3.2.1	114	cg	PHREEQC	Does this stand for something?	
	3.7-115	Bt	The major difference between the two approaches is that the PHREEQC approach predicted that the water would likely turn acid as the PAG rock oxidized, and the acid would trigger higher concentrations of sulfate, TDS, aluminum, and certain metals. Both approaches predicted that sulfate, TDS, anitmony, aresenic, cadmium, lead (when not adsorbed), manganese, molybdenum, nickel, selenium, zinc, and mercury concentrations would exceed AWQC.	Since models predict not only ARD but also the contamination of the water with these metals, the WRF, and all facilities with the potential to generate contaminated leachate for the life of the facility (i.e. in perpetuity for the WRF), should be lined and the leachate be collected and treated before release.	
3.7.3.2.1	120	cg	A hardness of 400 mg/L was used for all calculations.	There is no explanation as to why 400 is the proper value to use	
3.7.3.2.1	122	cg	Aquatic life for fresh water hardness-dependent criteria. A hardness of >400 mg/L was used for all calculations	a hardness of 400 (not greater than) was used but there is no explanation as to why this value is appropriate	
3.7.3.2.1	125	cg	A hardness of 400 mg/L was used for all calculations based on modeled values for hardness.	What was modeled?	
	3.7-126	Bt	According to the numerical hydrogeologic model developed by BGC (2011d, 2015g), for about 52 years after pit dewatering is stopped, water would flow into the pit from the groundwater at higher elevations and from the pit into pore space of the waste rock placed as backfill and into the localized bedrock outside of and surrounding the pit from which the bedrock water had been removed during mining. Additional description of the temporary localized flow reversal into bedrock as the pit fills is given in Section 3.6, Groundwater Hydrology. The pit outflow may result in an elevated input of sulfate and metals and decreased pH to the bedrock portion of the aquifer during the period that the lake is filling.	We recommend water quality monitoring the groundwater around the pit for the movement of contamination. The monitoring should be done in real-time with the best available technology at the time. The technology should be reviewed periodically during the duration of the monitoring. The monitoring should continue until the model is confirmed that the water is flowing back toward the pit and no further groundwater contamination is present in the groundwater. If groundwater contamination is found to be travelling away from the pit, and plan should be in place to remediate the contaminated groundwater as soon as possible to prevent the spread of contamination.	
		bt	Pumping would be required to get TSF and SRS water to the pit rim, where it would be combined with the WRF seepage, then flow via a gravity-fed pipe to the bottom of	How much hydraulic head would need to be generated to ensure the water flows to the bottom of the pit lake? Will additional pumping be required to generate the head to ensure the water flows as anticipated? How will pumping be	

			the pit lake.	assured in perpetuity?	
3.7.3.2.1	128	cg	A value of 65 mg/L as CaCO3 was used for hardness, based on model predictions for calcium and magnesium (not shown).	The model prediction of what? Please explain this and why it is the proper value to use	
3.7.3.2.1	128	LE	First mention of "exhausted PAG" in the text	Needs a definition/explanation	
3.7.3.2.1	130	cg	A hardness of 65 mg/L as CaCO3 was used for hardness, based on model predictions for hardness.	The model prediction of what? Please explain this and why it is the proper value to use	
3.7.3.2.1	131	cg	A hardness of >400 mg/L was used for all calculations based on modeled values for hardness.	a hardness of 400 (not greater than) was used but there is no explanation as to what was modeled or why this value is appropriate	
	3.7-135	Bt	The results of the various modeling efforts of the predicted pit lake suggest that 1) the concentrations of several constituents in surface waters would exceed the most stringent AWQC throughout the 100-year modeling period and 2) the pyrocline is predicted to move upward toward the surface and become less intense over time, eventually reaching the surface and allowing complete mixing at some point beyond the modeling period.	What are the implications for the AWT? Will the treatment system need to be revisited if the modeled scenario occurs? How will this be monitored? We recommend real-time monitoring to the pit lake stratification using the best available technology at the time. The technology should be reviewed periodically throughout the life of the pit lake, i.e. in perpetuity.	
3.7.3.2.2	136	cg	The predicted treated water quality is given in Table 3.7-39, along with AWQC	Why is there no explanation of the inputs to determining the WQS specifically hardness?	
3.7.3.2.2	139	cg	hardness value of 90.18 mg/L as CaCO3.	no explanation as to why this value is appropriate for determining WQS (like: DEC uses the 15th percentile hardness to determine criteria to be used in permits and a statistical analysis on the historic values from Crooked Creek results in this value)	
3.7.3.2.2	141	cg	A flow diagram of the conceptual WTP is given in Figure 3.7-24. The Water Treatment Plant (WTP) would typically	A flow diagram of the conceptual WTP is given in Figure 3.7-24. The WTP would typically	
3.7.3.2.2	143	cg	not expected to meet Applicable Water Quality Criteria (AWQC)	not expected to meet AWQC	
3.7.3.2.2	143	cg	larger contribution of surface water inputs relative to treated groundwater inputs would be expected to attenuate changes to water temperature within Crooked	depending on the condition of the effluent, this is basically the definition of a mixing zone and the WQS regulations allow no mixing zone in Crooked Creek	

			Creek during construction. Existing		
3.7.3.2.2	143	cg	As a result of the effective water management and treatment processes proposed under Alternative 2, impacts to water quality in Crooked Creek resulting from discharges of treated pit dewatering water would be low in magnitude because the effects would be below, or treated to be below, AWQC.	This paragraph should reference back to Table 3.7-39 for a comparison of treated water quality with WQS	
3.7.3.2.2	144	cg	metal leaching in WR samples, rock material	Assume this means Waste Rock but a short cite is not previously provided in Chapter 3	
3.7.3.2.2	145	CE	Five primary mechanisms would be responsible for potential impacts to surface water quality at the mine site during the operational phase:	The five mechanisms listed are important; however the potential for an increase in methylmercury production should also be included. The impacts of methylmercury production are difficult to predict because methylation is influenced by several variables. Despite the uncertainties surrounding predicted impacts on methylmercury production, acknowledging the potential for this impact is important due to the large increase in toxicity of methylmercury compared to inorganic mercury and methylmercury's propensity to bioaccumulate in fish tissue. The mine operations could increase methylmercury production in several ways: 1) through the increase in sulfate loading to area streams; 2) through the increase organic carbon loading; and 3) through an increase in inorganic mercury loading. All three of which are expected to occur. As such, an increase in methylmercury in response to these variables does not seem unlikely. Methylmercury production may occur within the bed sediment of streams or rivers where anoxic conditions may be present.	
3.7.3.2.2	146	cg	meet applicable water quality criteria and permit	Meet AWQC and permit	
3.7.3.2.2	149	cg	an intermediate soil acidity (pH ~5.0) and C/N ratio (~20).	From the text, this C/N ratio is lower not intermediate	
3.7.3.2.2	149	CE	The 2013 field program samples show that the total mercury concentration in the upland soil (average of 260 µg/kg) is slightly lower than in the wetland	The statement that wetlands are a mercury sink is based on the wetland soil having a higher concentration than the uplands. However, this premise is not sufficiently established.	

			soil (average of 320 µg/kg), although the variance in the soil concentration data was high in both cases. The relative differences suggest that the wetlands in the study area presently act as a sink for total mercury relative to upland areas (ARCADIS 2014).	Statements regarding one average being higher or lower than another average value need to be backed up by statistics. Without any measure of variability around the averages or statistical tests, the reader is not able to evaluate whether the concentration in upland and wetland soils are significantly different. Unless this is established, the validity of statements regarding wetlands acting as a mercury sink cannot be determined. The referenced document ARCADIS 2014 does not provide this statistical information either. Visual assessment of the data in Figure 4-4 in ACRADIS 2014 does not look like there would be a difference in the Hg concentrations between the upland and wetland sites.	
3.7.3.2.2	149	CE	These ratios of total mercury to methylmercury are typical of boreal wetland and upland soils (ARCADIS 2014). Similar fractions (approximately 1 percent methylmercury) were detected in a similar system evaluated in northern Minnesota (a boreal system dominated by spruce/moss/shrub wetlands), which was characterized as having low methylmercury production (Hines et al. 2004).	1) Hines et al., 2004 measured mercury and methylmercury in lake sediments. Lake sediments in Minnesota should not be considered similar/or a surrogate for upland soils in Alaska. The text indicating these systems are similar is misleading. 2) Overall, Hines et al. 2004 does not characterize the study location as having a particularly low methylmercury production potential relative to other landscapes, which is what is being implied in this sentence. The Hines et al, 2004 paper does mention that the percent methylmercury in sediment cores and pore water was relatively low compared to the water column. But this is a different conclusion than what is implied in the sentence in the DEIS. Obrist et al, 2012 Environ. Sci. Technol. provides a very comprehensive survey of soil mercury, methylmercury and percent methylmercury for soils across the US and globally. The summary data presented in this paper show that the percent methylmercury to total-mercury is typically less than 0.5% and in many ecosystems systems is less than 0.1%. Similarly, as part of the recent Western North American Mercury Synthesis project, Fleck et al, 2016 (Sci. Total. Environ.) showed that the least square mean percent methylmercury in Western stream sediment was ~0.8% and in wetland sediment was ~1%. As such, the characterization of the landscape surrounding the	

				Donlin project as having low methylmercury production because the percent of methyl to total-mercury is around 1% isn't consistent with the breadth of scientific literature on methylmercury levels in soil and sediment. 3) The Hines et al, 2004 study was conducted in the Marcell Experimental Forest, MN, which has been the subject of numerous studies on mercury cycling. Several of studies from this area have results that are relevant to the assessment of methylmercury production near Donlin. For example, Mitchell et al, 2008 in Applied Geochemistry added sulfate to the peatlands and found that it resulted in a considerable increase in methylmercury production. These results suggest that a similar impact could occur through increased sulfate loading during the mine operations. Another study from the Marcell forest used a sprinkler system to add sulfate to a peatland…with no changes in any other variables. From a press release they found: "Each time the sprinklers ran and extra sulfate rained down on the peatland, methylmercury levels spiked upward. Nothing like that was observed in the half of the peatland not receiving the sulfate addition." The details are available in Coleman-Wasik et al, 2012 Environ. Sci. Technol. In another study from the Marcell Experimental Forest showed that MeHg "hot spots" occurred at discrete point and bands within the landscape (Mitchell eta l, 2008, Environ. Sci. Technol.) The spatial variability in this dataset underscores the difficulties in trying to accurately characterize methylmercury dynamics across a landscape, the pitfalls of focusing on landscape mean values when characterizing an area's potential for methylmercury production, and highlights the uncertainty associated with predicting the impacts of sulfate, carbon, and mercury loadings to a landscape. If the Marcell forest area in northern Minnesota is considered similar to the conditions at the proposed gold mine site (as indicted in the DEIS), then an examination of the numerous studies that have originated from this site clearly indicating	

				the role of increased sulfate addition in stimulating higher methylmercury production should also be included.	
3.7.3.2.2	149	CE	In freshwater aquatic ecosystems, shallow sediment catchments and the anoxic bottom waters of stratified lakes are important zones of net methylation. Methylation is less prevalent in environments with higher flow and low hydraulic retention (St. Louis et al. 1994). In-river methylation is typically a negligible component of the methylmercury budget for creeks, and wetlands are frequently the most important contributor of methylmercury to downstream aquatic ecosystems (St. Louis et al. 1994, Berndt and Bavin 2012).	Later in this section, comparisons are made to the Marcell Experimental Forest in northern MN indicating it is a "similar system" to the area of the proposed mine. Research from this ecosystem has shown the importance of MeHg production in peatlands (e.g. Mitchell et al., 2008 Environ. Sci. Technol.); however this source of methylmercury production is not mentioned here.	
3.7.3.2.2	149	CE	Sulfate concentrations in soils were very low in all of the samples. At relatively low sulfate concentrations (approximately 50 mg/kg and lower), mercury methylation is limited by the rate of sulfate reduction, while at high sulfate concentrations (greater than 100 mg/kg) sulfide buildup from sulfate reduction results in decreased methylation of mercury (Fitzgerald and Lamborg 2014).	In order to understand the impact on methylmercury production, sulfate should not be measured in the solid phase as it was in the ARCADIS 2014 study, but should be measured in the aqueous phase, either as surface water or pore water. It does not appear that any measurements of sulfate in the aqueous phase, even from wetlands, were obtained as part of the assessment of site conditions. Without any data on sulfate concentrations in the aqueous phase (where it would be available to microbial community that methylate mercury), statements should not be made that the sulfate available is limiting methylation.	
3.7.3.2.2	149	CE	Sulfate levels in the wetland systems in the study area are insufficient to support high activity of sulfate reducing bacteria (SRB), the microorganisms predominantly responsible for mercury methylation (ARCADIS 2014).	This is a bold statement and is not supported by the data collected. Sulfate data in wetland water was not collected in the ACRADIS 2014 study. Solid phase measurements of sulfate may not be representative of aqueous phase values. From the perspective of bacteria, the aqueous phase sulfate concentrations are what matters.	
3.7.3.2.2	149	CE	Sulfate levels in the wetland systems in the study area are insufficient to support high activity of sulfate reducing bacteria (SRB), the microorganisms predominantly responsible for mercury methylation (ARCADIS 2014). These results suggest that current rates of mercury methylation in wetlands and uplands in the vicinity of the proposed mine facilities are low.	The methylmercury concentrations measured in the upland and wetland soils were around 1 ug/g. For comparison, in the comprehensive assessment of 344 streams sites in the USGS report (Scudder et al, 2009), the median methylmercury concentration was 0.5 ug/g and the mean was 1. 7 ug/g. Compared to the median value from the USGS report the	

				concentrations measured near the proposed mine site aren't particularly low. The maximum concentrations in the upland and wetland soils was around 4 ug/g measured near the mine site, which are definitely not low concentrations. As shown in Mitchell et al. 2008 Environ Sci Technol there may be "hot spots" of methylmercury production within the landscape, which depending on their hydrological connectivity to area waters could be disproportionally important in delivering methylmercury to area waterways and biota. As such, the statement that rates of mercury methylation in the wetlands and uplands near the proposed mine are low, is not supported by the dataset.	
3.7.3.2.2	150	CE	Methylation rates are not expected to increase as a result of the activities proposed under Alternative 2 because low nutrient availability and low levels of sulfate reducing bacteria activity currently limit the mercury methylation potential in project area wetlands, and these drivers would not be altered as a result of the activities proposed under Alternative 2	The variables associated with mercury methylation (organic carbon, sulfate, sulfide, etc) were not measured in wetland waters. As such, there has been insufficient characterization of the methylation potential within area wetlands to make such conclusions.	
3.7.3.2.2	150	CE	Mercury methylation rates in project area wetlands are not expected to increase as a result of the activities proposed under Alternative 2, and the amounts of mercury converted to methylmercury in these systems would not be expected to increase in proportion to increases in mercury deposition. Mercury methylation rates in project area wetlands are currently limited by low levels of nutrients and low activity of sulfate reducing bacteria in the anoxic environments requisite for mercury methylation.	There is insufficient data to suggest that the rate of methylmercury production is limited by nutrient levels and would be unaffected by changes in inorganic mercury loading.	
3.7.3.2.2	150	cg	the amounts of mercury converted to methylmercury in these systems would not be expected to increase in proportion to increases in mercury deposition. Mercury	Why not? If the rates stay the same (even if they are low) and additional mercury is deposited into the system, why wouldn't the increase be proportionate? If it isn't, then the rates do not remain the same.	
3.7.3.2.2	151	cg	EPA approved aquatic life criteria of 2,400 ng/L (acute) and 12 ng/L (chronic) (EPA 2013k), and the Alaska water quality standard of 50 ng/L for total recoverable mercury	Since 2400 and 12 ng/L are listed as aquatic life criteria, it seems appropriate that the 50 ng/L should be denoted as the human health criterion for the consumption of water and organisms.	

3.7.3.2.2	151	CE	New inputs of mercury of atmospheric origin may be more or less bio-available than older or geologic sources of mercury; thus, the new inputs of mercury from the mining activities may be more or less available for mercury methylation processes relative to older mercury within the area (whether of geologic or atmospheric origin).	The text is ambivalent about the bioavailability of new versus old mercury. However, there are several studies that have been conducted on this topic and can be used to help make predictions. The results from several studies have shown that that newer inputs are more bio-available than older mercury (e.g. Harris et al, 2007 PNAS: Orihel et al, 2008 Environ Poll). If there are any studies out there that have shown the opposite to be the case, we are not aware of them, and they should be cited here in the text. If good citations showing that older mercury can be more available than new mercury inputs, then this sentence should be revised to indicate that the new inputs are likely more (not "more or less") available for methylation.	
3.7.3.2.2	151	CE	Studies of mercury mass balances in forest-dominated catchments have shown that mercury inputs to aquatic systems are more heavily dominated by contribution from wetland runoff (St. Louis et al. 1996; Selvendiran et al. 2008; Berndt and Bavin 2012) than by atmospheric deposition.	Add text: "…however, most of the mercury in the wetlands is also of atmospheric origin."	
3.7.3.2.2	151	CE	Current estimates indicate that rates of methylmercury production in project area wetlands are low, and are not expected to increase substantially due to the project	This is a very important statement with regard to the potential impacts of the mine. However, this statement is not adequately supported by the data collected. For example, data is not presented in the DEIS on methylmercury concentrations in wetland water. In addition, the data on methylmercury concentrations in sediments are not particularly low when compared to other locations (see Obrsit et al, 2012, Environ. Sci. Technol.).	
3.7.3.2.2	151	CE	For this reason, methylmercury concentrations in aquatic systems may change very little if mercury inputs to streams are dominated by wetland runoff rather than atmospheric deposition (ARCADIS 2014).	In order to make statements like this, it needs to be established that wetland runoff is the dominant water source to area streams.	
3.7.3.2.2	151	CE	Because the rates of mercury transformation and transport in upland/wetland systems and aquatic sediments are not expected to change as a result of the project activities, a	This assumption is not conservative. Several studies have shown that "new" sources of mercury are more available for methylation than "old" sources (see previous comment). Here	

			linear response between atmospheric deposition rates and mercury concentration in surface water is assumed (ARCADIS 2014). This assumption is conservative because it precludes consideration of the phase partitioning of the mercury deposited from atmospheric sources, and the possibility that a large fraction of the mercury deposited from atmospheric sources would partition into soils and sediments in the project area and would not be present in surface water.	it is assumed that they are equally bioavailable. This assumption likely under predicts that amount of mercury that could be methylated. It is correct that a large proportion of atmospherically deposited mercury will become bound in the soil/sediment matrix and may not be available for methylation in the near-term or possibly ever. However, this may already be accounted for when predicting how much methylmercury would be generated from a given input of inorganic mercury. The fact that the response between atmospheric deposition and mercury concentrations in water is linear doesn't tell us much. To properly assess this we need to know the slope of this linear response. For example, you could have atmospheric deposition increase from 10, 20, 30 ug; and water concentrations increase form 1, 2, 3 ug. This would result in a linear response; but is not inherently conservative in terms of the magnitude of the response.	
3.7.3.2.2	152	CE	The evaluation of the estimated impacts to concentrations of total mercury in surface water shown in Table 3.7-41 above is considered conservative because the majority of mercury potentially deposited as a result of the activities proposed under Alternative 2 would be particulate mercury, which would tend to rapidly settle out of the water and become buried in stream sediments (ARCADIS 2014).	The ARCADIS 2014 makes this same statement; however the report does not provide any details to back up this statement. ARCADIS 2014 does not provide any data on: 1) depositional versus erosive properties of area streams; 2) settling or sedimentation rates for particles in the area streams. Because the ARCADIS 2014 document does not provide any additional analysis on the aqueous fate of mercury associated with particles, this citation should be removed from the EIS text here. Most readers of the EIS may not have time to check the supporting documents, and therefore, by providing a citation for this statement it gives the impression that more detailed analysis has been performed in the cited document. The assertion in the text is the mercury deposition associated with particles will be quickly removed from active cycling through burial in stream sediments. However, it has not been established that the areas streams have depositional areas, and that the rate of deposition from "clean" geogenic particles is relatively high such that particles of atmospheric origin	

				would be rapidly buried.	
3.7.3.2.2	153	CE	In addition to total mercury, a model was developed to predict mercury and methylmercury concentrations in surface water based on concentrations of dissolved organic carbon (DOC) in the water, suspended sediments, flow and velocity, and watershed size (ARCADIS 2014). Using a DOC concentration of 20 mg/L, the modeled concentration of total mercury in surface water is 8.6 ng/L, very close (within approximately 5 percent) to the measured average concentration of total mercury in surface water of 8.16 ng/L within the Crooked Creek and Donlin Creek watersheds (ARCADIS 2014).	1) Why was a DOC of 20 mg/L chosen? This seems like an unrealistically high value; with no data presented to support it. From the USGS streams report the average DOC concentration from 349 streams was 5.1 mg/. In Wang et al, 1999 they measured DOC in the Kuskokwim River which ranged from 2.0 to 2.4 mg/L and in tributaries that ranged from 1.8 to 6.8 mg/L. Here a concentration is assumed that is 4X higher than a nationally derived average and even higher than has been measured locally in other studies. This high value of DOC is contradictory to statements elsewhere in the DEIS suggesting that the methylation potential of the area is low, partially due to carbon limitation. In the model equation the largest coefficient is associated with DOC. This means that the output from the model is highly impacted by the DOC concentration used. This underscores the need for a more accurate DOC value to be used and highlights that the resulting inorganic and methylmercury concentrations predicted are highly influenced by the uncertainty in the DOC value used. 2) It appears that the model was solved for DOC using measured mercury concentrations from the site; such that when a value of 20 mg/L is used, it very closely predicts the mercury concentration within 5 percent. This agreement between measured and predicted concentration is used to suggest that the model performs well and can provide a good representation of area conditions; however this is not the case and is particularly deceiving by presenting a false sense of agreement between the modeled and measured values. If more reasonable concentrations of DOC were used in the model (i.e .2-5 mg/L), then a very different conclusion would emerge--that the predicted inorganic mercury concentrations are not well predicted by the model.	
3.7.3.2.2	153	CE	Using a DOC concentration of 20 mg/L, the modeled concentration of total mercury in surface water is 8.6 ng/L, very close (within approximately 5	The model “accuracy” for inorganic mercury is used to suggest that it can be used to accurately predict methylmercury	

			percent) to the measured average concentration of total mercury in surface water of 8.16 ng/L within the Crooked Creek and Donlin Creek watersheds (ARCADIS 2014). Based upon the similarity between measured and predicted concentrations of mercury using this model, the existing methylmercury concentration was estimated to be 0.280 ng/L within the Crooked Creek and Donlin Creek watersheds (ARCADIS 2014).	concentrations. This is used to come up with a baseline MeHg estimate for area streams of 0.280 ng/L. This value is presented with 3 significant figures, and no associated measurement of error. How was it determined that the methylmercury concentrations can be predicted with an accuracy of 3 significant figures to the thousandths place? Note: reporting limits for methylmercury using EPA 1630 are 0.05 ng/L; so at minimum the significant figures should not be below the hundredths place when expressed in ng/L. As mentioned in the text the regression equation from which this methylmercury estimate was derived has a low r^2 value of 0.48. This uncertainty in the equation should be propagated through the calculations to provide a measure of the error associated with the 0.280 ng/L value. The value is of 0.280 has a huge amount of uncertainty associated with it, particularly because it heavily relies on an unrealistically high DOC concentrations as one of the most influential parameters in the model.	
3.7.3.2.2	153	CE	Using the same approach used to estimate the increase in the average concentration of total mercury in the water column based on increases in average highest mercury deposition rates over the confluence of the Crooked Creek and Donlin Creek watersheds (3.55 µg/m2/y), average methylmercury concentrations in surface water are estimated to increase from 0.280 ng/L to 0.398 ng/L, an increase of 42 percent over baseline as a result of the activities proposed under Alternative 2 (ARCADIS 2014).	1) As mentioned above the validity of the 0.280 ng/L value is highly questionable; as such this estimated increase in concentration to 0.398 ng/L is also a highly questionable value. As above, this value should not have 3 significant figures and also should include a measure of uncertainty around the estimate. 2) The estimated new value does not take into account the effect of increased sulfate loading, which could be one the main variables driving changes in methylmercury in area waters. 3) From ARCADIS 2014 it states: "Using the same approach to estimate increase in the average concentration of total mercury in the water column based upon an increase in average highest deposition rates over the confluence of the Crooked Creek and Donlin Creek watersheds (3.55 µg/m2/y), the methylmercury concentration in the water column is	

				estimated to increase from 0.000280 µg/L to 0.000398 µg/L." As such, the referenced document doesn't give any additional information on the factors controlling the increase in methylmercury concentrations. However, it does state the same approach for methylmercury was used as for total mercury. This seems like a very inaccurate way to predict changes in methylmercury. The processes involved in increasing total mercury are very different than the processes involved in increasing methylmercury. It is mentioned elsewhere in the DEIS that there are multiple factors that contribute to changes in methylmercury concentrations. However, these factors do not increase total mercury concentrations. As such, the approach taken to estimate an increase in methylmercury is inconsistent with the large body of literature on methylmercury dynamics and is inconsistent with the discussions around the complexity of methylmercury elsewhere in the DEIS. 4) In developing the baseline methylmercury estimate, an equation was used that does take into consideration the total mercury concentrations (see Brigham et al, 2009). This acknowledges the fact that the factors contributing to methylmercury concentrations can be decoupled to a large extent from total mercury concentrations. However, when it comes to estimating the increase in methylmercury concentrations the DEIS relies on an approach that relies only on changes in the total mercury concentrations. As such there is an inconsistent treatment in the processes being used to predict the methylmercury concentration in this document. 5) On page 3.7-32 it states: "Preliminary results from the June 2013 sampling event (Table 3.7-6) indicate that methylmercury concentrations range from below the detection limit (0.020 ng/L) to 0.058 ng/L." These measured values are quite a bit lower than the 0.280 ng/L concentration predicted in this section of the text. If measured methylmercury concentrations are already available for the site, is it necessary to estimate values using this model?	

				Particularly when the model predicts much higher concentrations than were measured.	
3.7.3.2.2	153	CE	"Based upon the similarity between measured and predicted concentrations of mercury using this model, the existing methylmercury concentration was estimated to be 0.280 ng/L within the Crooked Creek and Donlin Creek watersheds (ARCADIS 2014). For comparison, the USGS has published a comprehensive study of stream methylmercury concentrations (n=337) throughout the US (Scudder et al. 2009). In this report the average methylmercury in stream sites is 0.19 ng/L,"	The median national MeHg concentration is 0.11 ng/L from the Scudder et al, 2009 document. As such, the baseline predicted methylmercury concentration in water in the Donlin Creek area is above the average predicted in other streams and is more than 2-times higher than a national median value. Such information is inconsistent with the statement in the DEIS that "The potential for mercury methylation in these environments is low". It is already stated that the concentrations are higher than national mean and median values. By what measure then are methylmercury concentrations considered to be low? The theme that the area surrounding the proposed mine site has low methylmercury concentrations and low methylation potential is mentioned numerous times in the DEIS to suggest that there will be limed impacts from the mine. However, this assertion of low methylmercury concentrations is not supported by the estimates of methylmercury for the streams or the high organic carbon content estimates for area streams.	
3.7.3.2.2	154	cg	mercury (10,00 ng/L),	What is this value supposed to be?	
	3.7-156	bt	Table 3.7-42	Please include a graph showing the trend of contamination beyond year 99 since the pit lake will be present beyond year 99. This will show the potential for water contamination in the timeframe of the existence of the pit lake.	
3.7.3.2.2	157	cg	Acute and chronic aquatic life numeric criteria for some metals (Cd, Cr, Cu, Pb, Ni, Zn) are hardness dependent. Values may be slightly different than those in other tables due to differences in the way hardness-dependent standards were calculated.	What hardness was used and why? Are they dissolved or TR? Looks like 65 for diss Cd, Ni, Pb and Zn. But Cu uses a hardness around 82	
	3.7-158	Bt	However, the release of SRS water to the environment during the approximately 52-year period during which the covered tailings would drain and consolidate would only occur in the event of a pump failure greater than two weeks in duration, and such an event is considered unlikely	We recommend real-time monitoring of the system using the best available technology at the time. The technology should be reviewed and updated periodically. The monitoring should continue as long as the SRS system is required.	

			under Alternative 2.		
3.7.3.2.2	159	cg	Criteria are expressed in terms of dissolved metal in the water column.	All of the hardness based metals are total recoverable not dissolved values.	
3.7.3.2.2	159	cg	calculated using a hardness value of 90.18 mg/L	there is no explanation as to why this value is appropriate	
3.7.3.2.2	162	cg	The duration of such impacts would be considered long-term because the impacts would be likely to persist for the duration of the project, and water quality would return to baseline levels at some time following the completion of mining activities.	But doesn't the road stay for long term monitoring well past the completion of mining activities?	
3.7.3.2.2	163	cg	The Erosion and Sedimentation Control Plan	The ESC Plan	
3.7.3.2.3	3.7-165	Bt	The generation of seepage and runoff with elevated metals concentrations derived from metal leaching from the lower CWD construction material could potentially infiltrate shallow (alluvial) groundwater resources in the immediate vicinity of the Lower CWD.	In order to prevent groundwater contamination in the area, we recommend lining all facilities with the potential to contaminate groundwater. The alluvial groundwater quality should be monitored to detect any contamination resulting from leachate in the lower CWD, and the contamination should be mitigated as soon as it is detected.	
		Bt	Water from the WRF would have concentrations of several constituents that are predicted to exceed the most stringent AWQC, and therefore adverse impacts to groundwater quality would occur in areas underneath and immediately adjacent to the WRF.	In order to prevent groundwater contamination in the area, we recommend lining all facilities with the potential to contaminate groundwater. The groundwater quality should be monitored in real-time for the life of the facility using the best available technology at the time to detect any contamination resulting from leachate from the WRF, and the contamination should be mitigated as soon as it is detected. The technology should be reviewed periodically for the life of the facility, i.e. in perpetuity.	
	3.7-166	Bt	A layer designed to minimize infiltration would be placed over portions of the WRF as the placement of waste rock in those areas is completed, and the surface of this layer would be contoured to direct precipitation to the lower CWD (BGC 2011b).	This is confusing as to if the entire WRF will eventually be covered with a low permeability cover. Regardless, in the lifetime of the facility it can be expected that the cover will be breached by animals and vegetation. How will Donlin monitor the integrity of the cover for the life of the facility?	
	3.7-167	Bt	When pit dewatering is stopped, water would flow from the pit into the bedrock depressurized by dewatering wells underlying the proposed project area; this would result in	The time period between the cessation of pit dewatering and pumping of the pit lake is approximately 52 years. During this time there is the potential for the contaminated groundwater	

			inputs of sulfate and metals, and decreased pH, to the deep bedrock portions of the aquifer.	to migrate away from the pit and outside the cone of depression created by the lake. We recommend monitoring to ensure that the outward migration of contamination does not occur. If groundwater contamination is shown to be leaving the project area, mitigation of the contaminated groundwater should occur. We recommend real-time monitoring using the best available technology at the time. The technology should be reviewed and updated periodically. The monitoring should be done until the cone of depression created by the pit lake has removed all contamination from the area aquifers.	
		Bt	The principal mechanisms responsible for effects to groundwater quality at the mine site would be inputs of seepage from the WRF, and the discharge of water from the pit to the surrounding deep bedrock groundwater.	We recommend preventing groundwater contamination wherever possible. This would include lining all facilities with the potential to contaminate groundwater.	
3.7.3.2.3	168	cg	and the resource is governed by regulation.	Whose regulation because in several places, the DEIS states that the State does not regulate groundwater and if they don't, who does?	
3.7.3.2.3	169	cg	Groundwater drainage patterns should reestablish after site reclamation has been completed (SRK 2013b).	if the pipeline is abandoned in place, shouldn't drainage patterns either reestablish sooner or find alternate routes long before reclamation?	
3.7.3.2.4	170	cg	Table 3.7-44	The % increase for Donlin looks right (175-173)/173 = .012 or 1.2% but the rest don't: Grouse: (238-236)/236 = 0.008 or 0.8% not 0.6 Bell: (206-205)/205 = 0.005 or 0.5% not 0.2 Flat and Village creeks show no increase and yet one of the highest % increase is for Village	
3.7.3.2.4	171	CE	The potential for mercury methylation in these environments is low and is generally limited by the availability of bioavailable carbon and other nutrients, which are required to sustain heterotrophic microbiological activity that drives the methylation of mercury in anoxic environments (ARCADIS 2014)	Earlier on page 3.7-153 the document, it is assumed that the area streams have a DOC concentration of 20 mg/L. To contextualize this level of DOC, the USGS stream report from 2009 (Scudder et al.) found the average national DOC concentration to be 5.1 mg/L. Therefore, this EIS is stating that the areas stream have 4-times higher carbon	

				concentration than national averages, and yet the area around the mine has a low ability to methylate mercury in part due to low bioavailable carbon. This is theoretically inconsistent. The emphasis in this EIS on "other nutrients" being important and the C:N ratio being a strong indicator of the geochemical potential for mercury methylation is supported from some studies in the literature (notably Tjerngren et al, 2012). However, within the very large body of literature on mercury methylation, the C:N ratio is not frequently mentioned. If there are studies in addition to those of Tjerngren et al, 2012 that have come to same conclusion regarding the importance of C:N ratios in predicting methylation potential, then these should also be cited. This is not to say that the C:N ratio is not important, but that it may not be as a good of a predictor of methylation potential as other variables, such as carbon, inorganic mercury, and sulfate. For example, from the Scudder et al, 2009 USGS stream report they measure: "characteristics thought to affect Hg methylation, such as loss-on-ignition (LOI, a measure of organic matter content) and acid-volatile sulfide in bed sediment, and pH, dissolved organic carbon (DOC), and dissolved sulfate in water." They do not focus on measures of nitrogen in order to calculate the C:N ratio in order to better understand the important variables related to methylmercury production. This sentiment is echoed throughout the vast majority of literature on mercury methylation. For example, as part of the Western North American Mercury Synthesis project, Fleck et al., 2016 (Sci. Total. Environ.) found that 76% of the spatial variability in methylmercury concentrations could be explained by variations in the total mercury concentrations and other landscape variables; which did not include the nutrient status of wetlands. The DEIS relies heavily on a study where the C:N ratio is shown to be related to methylmercury; while these findings may be correct, they are much less understood when compared to the much larger body of literature showing the elevated sulfate	

				concentrations can stimulate methylation, regardless of C:N ratio. In general, the streams in this area are predicted to have 1) relatively high inorganic Hg concentrations; 2) relatively high organic carbon concentrations, and 3) very high sulfate concentrations. The combination of these 3 factors would suggest that an area would have high potential for mercury methylation.	
3.7.3.2.4	171	CE	However, due to the relatively low organic content of soils within the cone of depression, the resulting pulse of bioavailable carbon is likely to be small.	If the organic content of soils is low, how is it reasonable to predict stream DOC concentrations to be 20 mg/L earlier in the DEIS. These two pieces of information should be reconciled when characterizing the landscape.	
3.7.3.2.4	171	CE	Thus, aquatic systems in the study area have a low rate of methylmercury production, and this rate is not expected to change as a result of the activities proposed under Alternative 2 (ARCADIS 2014).	This statement is inconsistent with: 1) the baseline methylmercury concentrations already predicted to be 2-times higher than a nationally generated median concentration; 2) the high DOC concentrations predicted to occur in the streams; 3) the relatively high inorganic Hg concentrations from mine and existing geogenic sources; and 4) the increases in sulfate releases to area streams. All of these lines of evidence suggest that the study area could have a relatively high rate of methylmercury production currently and could be increased in response to mining activities.	
3.7.3.2.4	176	cg	the Erosion and Sedimentation Control Plan	the ESC Plan	
3.7.3.2.4	176	cg	If the pipe is abandoned in place at project closure, as may be authorized by the Pipeline Abandonment Plan, any new impacts	Since this is a discussion of Alternative 2, Donlin's proposed alternative, why doesn't this include what they propose to do?	
3.7.3.2.6	180	cg	Implementation of SWPPPs and/or Erosion and Sediment Control Plans;	Implementation of SWPPPs and/or ESC Plans;	
3.7.3.2.7	185	cg	The most stringent applicable water quality criterion for turbidity in marine waters specifies that turbidity may not exceed 5 NTU above natural conditions when the natural turbidity is 50 NTU or less, and may not have more than 10	18 AAC 70.020(b)(24) states that for the Water Supply, Aquaculture use, the standard is: May not exceed 25 nephelometric turbidity units (NTU). For marine uses, there are no allowances for natural	

			percent increase in turbidity when the natural turbidity is more than 50 NTU, not to exceed a maximum increase of 25 NTU.	conditions for turbidity.	
3.7.3.2.7	186	cg	would result in greater potential for impacts to groundwater quality to result from spills associated with diesel fuel handling	would result in greater potential for impacts to groundwater quality from spills associated with diesel fuel handling	
3.7.3.5.1	189	cg	Geochemical direct, indirect, and cumulative impacts under Alternative 4	Is there a reason why “cumulative” is in a different font than the rest of the text?	
3.7.3.5.1	189	cg	applicable water quality standards	Usually referred to as “applicable water quality criteria” or AWQC	
3.7.3.5.1	189	cg	not to exceed a maximum increase of 25 NTU.	this disagrees with the criterion listed on both pages 3-161 and 163 which reflect the 15 NTU maximum of the freshwater recreational use	
3.7.3.6.2	194	cg	meet applicable water quality standards and expected	meet AWQC and expected	
3.7.3.6.2	194	cg	The water would be treated to meet applicable standards prior to discharge to Crooked Creek using a High Density Sludge (HDS)	The water would be treated using a High Density Sludge (HDS) – the deleted portion repeats what was said in the previous sentence	
3.7.3.6.2	194	cg	and progressive reclamation	Is “progressive” the same as concurrent?	
	3.7-198	Bt	If hydraulic containment of the groundwater system is lost, it is likely that contaminated groundwater would enter the flow system towards Crooked Creek, and it would be impractical to retrieve because the water would migrate outside the radius of influence of the SRS pond.	The SRS pumping and the groundwater surrounding the facility should be monitored in real-time using the best available technology at the time. The technology should be reviewed and updated periodically during the lifetime of the facility operations. If contaminate groundwater is found to be migrating outside of containment, then immediate remediation of the groundwater should take place.	
	3.7-200	Bt	Under Option 1, tailings seepage could potentially reach groundwater beneath the dry stack, although the underdrains would be expected to continue to capture some if not all of the tailings seepage. Seepage reaching groundwater would either 1) flow to the underdrains prior to reaching the SRS, or 2) flow through native material under the operating pond, and be captured by the cone of	Allowing groundwater to be contaminated for 200 years will should not be allowed. If this option is chosen, monitoring of groundwater around the facility should be required for the life of the facility, or until it is shown that no more seepage is being generated. The monitoring should be done in real-time using the best available technology at the time. The technology should be reviewed and updated periodically.	

			depression created by pumping the SRS and/or sentinel wells. Following removal of the operating pond and dam in closure, if contaminated groundwater is present in native materials beneath the dry stack or operating pond footprint, it would continue to migrate towards, and be captured by, the SRS and/or wells, and report to the pit lake. Meanwhile, the supply of tailings porewater that could potentially feed the contaminant plume would be reduced by the impermeable cover, and seepage flow through the dry stack would gradually reduce to the same as that predicted under Alternative 2 (and Option 2) after 200 years. In other words, a contaminant plume, if present under Option 1, would eventually improve in quality to that of Option 2 and Alternative 2. Beyond 200 years, the amount of seepage flow under Option 1 is expected to continue its gradual decline as a result of the impermeable cover blocking infiltration of water to the flow system.		
3.7.3.6.2	104-105	cg	Applicable water quality standards	AWQC	
3.7.3.6.2	105	cg	This increase represents about a 0.1 percent increase in fugitive dust emissions for the mine site as a whole, as other major sources of dust would not change under this alternative (e.g., pit, roads, etc.). The amount of dust generated from the dry stack under Alternative 5A relative to the tailings beach under Alternative 2 may be higher than a simple surface area correlation would suggest, however, due to lower moisture content, increased heavy equipment use, and higher elevation of exposed tailings (greater wind exposure) at the dry stack.	Given the information in the highlighted text, a 0.1% increase seems low. Including “however” seems unnecessary to the sentence.	
3.7.3.6.2	105	cg	The total increase in PM2.5 and PM10 emissions under Alternative 5A relative to Alternative 2 would be 2.9 percent and 8.3 percent, respectively	Given the difficulties in calculating percent increases in other areas of the DEIS, it would be nice to have the expected PM levels for both alternatives and they are not even provided in Section 3.8.3.7	
3.7.3.6.2	106	cg	The sample size, n, for each	The sample size, N, for each	
3.7.3.6.2	107	cg	Risk of SRS Pump Failure	if the risk of this under Option 2 and Alternative 2 are similar,	

				why does Alternative 5 get an entire section on this while the discussion in Alternative 2 is basically the same sentence in 2 different places saying the risk is low?	
3.7.3.6.2	108	cg	In either option, if the SRS pumping system were to go completely off-line, the SRS would likely fill to overflowing and/or lose hydraulic containment	if this is true of Option 2 couldn't the same be said for Alternative 2	
3.7.3.6.2	108	cg	Under both Options 1 and 2, an event leading to the release of uncontained SRS water to the surface waters of Anaconda Creek or Crooked Creek would result in high-intensity impacts to	aside from a statement in the synopsis, this is not discussed for Alternative 2	
3.7.3.6.2	108	cg	would exceed applicable water quality standards	would exceed AWQC	
3.7.3.6.2	109	cg	protected by the Clean Water Act and	protected by the CWA and	
3.7.3.6.2	109	cg	Thus, considering the proposed lifespan of the SRS pumping system under Alternative 5A, particularly for Option 2, the possibility	Should "Option 2" be "Option 1" since its lifespan would be longer?	
3.7.3.7.1	202	cg	Geochemical direct and indirect cumulative impacts under Alternative 6A	Geochemical direct, indirect, and cumulative impacts under Alternative 6A	
3.8 Air Quality					
3.8.3.6	68	cg	This alternative would reduce the barge distance for freight and diesel out of Bethel bound for the mine site by about 69 river miles.	Chapter 2 (Section 2.3.5) and Section 3.23 (Transportation) says the reduction is 75 miles.	
3.9 Noise and Vibration					
No Comments					
3.10 Vegetation					
3.10.3.5	66	cg	69 miles downriver	Chapter 2 (Section 2.3.5) and Section 3.23 (Transportation) says the reduction is 75 miles.	
3.10.3.3.2	62	cg	Alternative 3A differs from Alternative 2 in that it would involve 75 percent fewer ocean fuel barge trips and 67 percent fewer river fuel barge trips because of the decreased use of diesel	Section 3.23 says the river barge traffic will decrease from 58 to 19 which is a 67% decrease as stated but for ocean going barges, the trips to Dutch Harbor decrease from 7 to 2 (71%) and the number from Dutch to Bethel decrease from 14 to 5	

			fuel.	(57%) so what is the basis for saying the ocean going barging will decrease by 75%?	
3.11 Wetlands					
General Comments					
Coordinating NEPA and CWA 404 Requirements		MJ	The DEIS environmental analysis should support the U.S. Army Corps of Engineers' CWA Section 404 and Rivers and Harbor Act Section 10 permit decisions. For this reason, the EIS should address compliance with the CWA Section 404(b)(1) Guidelines and the Corps public interest review. The analysis in the DEIS, however, creates a fundamental disconnect between the NEPA and the 404 permitting processes. The DEIS indicates that the wetland information may be inadequate to meet the Corps' permit review needs and would be revised later for the EIS or the permitting process.		
Preliminary Jurisdictional Determination			The EPA raises concerns regarding the wetland preliminary jurisdictional determination (PJD) for the Donlin Gold Project, which has not been approved at this stage of the environmental review process. The DEIS indicates that the wetland mapping process may have over-estimated the actual project wetland impacts and would be revised during the Corps' permit process to eliminate potential jurisdictional inconsistencies, and to determine adjusted areas of jurisdictional wetland impacts following recent jurisdictional guidelines. We recommend that the jurisdictional inconsistencies be corrected and the revised estimates of the wetland acreage impacts be included in the EIS. Accurate information regarding the acreage of direct and indirect wetland impacts associated with the alternatives is necessary to adequately compare alternatives in the EIS. The EIS should disclose the systematic process for reevaluating the jurisdictional wetland impacts, such as additional ground-truthing and mapping that may be required to verify the wetland/upland mosaics.		
Functional Assessment		MJ	The DEIS indicates that the functions of wetlands within the study areas were preliminarily assessed using a variation of the Hydrogeomorphic (HGM) rapid functional assessment method. Functional capacity indices (FCIs) for rating the functional performance and value for each of the five HGM classes were evaluated. The variables, assumptions, and calculations used to develop FCIs for each function and HGM class were described in the Donlin Gold Wetland Functional Assessment Report. As indicated in our previous comments on the Report, the EPA generally supports use of the modified HGM functional assessment method for evaluating HGM wetland classes and functions, and use of the FCIs for rating the functional performance and value for each wetland class in the study areas. We recommend that the FCIs be adopted to evaluate debits and credits for compensatory mitigation for the Donlin Gold Project. The DEIS notes that the Corps plans to complete a functional assessment for the proposed project at or after the EIS stage or the NEPA process. Our understanding is that the Corps' functional assessment would be based on the *Cowardin et al* classification system. We recommend that the EIS disclose to the public the basis and rationale for the Corps not accepting the modified HGM functional assessment method for the Donlin Gold Project. We recommend that the Corps' functional assessment approach include not only wetlands, but the functions of other types of waters that fall under Corps' jurisdiction, such as river channels and stream systems, lakes and ponds. In addition, we recommend that the Corps' functional assessment methodology include a debit and credit evaluation process to determine the options for wetlands, streams, and aquatic resources compensatory mitigation. The Corps' functional assessment method, and the revised wetlands and		

			aquatic resources information should be incorporated into the EIS. This revised information is important to evaluate the LEDPA under the CWA Section 404(b)(1) Guidelines. We would appreciate being involved in the development and/or review of the Corps' functional assessment methodology. The EPA requests a meeting to discuss the Corps' approach to the development of the functional assessment methodology, which may be applied to other projects in the future.		
3.11.1	3.11-3	Bt	Donlin Gold has submitted a watershed-based draft Compensatory Mitigation Plan (CMP) in coordination with federal, state, and local governments and landowners. The CMP would consider…	If this document has been submitted, it should be included as part of this EIS in order to better asses the impacts due to the project. At present only a Conceptual Compensatory Mitigation plan is included in the document, and this conceptual plan does not provide enough information to consider it an adequate plan. The next sentence, however, uses the future tense for the CMP suggesting the plan will be submitted in the future.	
3.11.2.2	6	KW	The functions of other types of waters that fall under Corps jurisdiction like river channels, lakes, and ponds were not evaluated.	This is a huge oversight. Without this, reviewing agencies may not be 7able to adequately determine the extent of functions lost due to the proposed project and it makes it difficult to determine adequate compensatory mitigation.	
	3.11-7	Bt	The Corps has determined that the Corps will complete a functional assessment for the proposed project at or after the FEIS stage or (sic) the NEPA process.	Not having a functional assessment makes it very difficult to determine the LEDPA for the project. We recommend providing the assessment in a timely manner for cooperating agency review prior to the FEIS.	
3.11.2.2	7	KW	The Corps has determined that the Corps will complete a functional assessment for the proposed project at or after the FEIS stage or the NEPA process. (This is stated twice on this page).	Is this correct? If so, the "Corps has determined that they will…" How comprehensive of extensive of an assessment is anticipated? Will it be for streams and wetlands? Is this just a review or enhancement to the existing work based on agency and stakeholder comments? Additional detail is warranted.	
3.11.2.2	7	KW	Wetland values	Recommend it be changed to "Wetland functions and values" as the section is talking more about the wetland functions and functional assessment as it relates to high valued wetlands. It might be helpful to define wetland value as well.	
3.11.3	12	KW	Permafrost maintained wetlands may be converted to non-wetlands following fires that remove the insulating organic mat that protects permafrost from receding and creating better drainage conditions (Post 1996). Wetland conditions	This potential temporal loss needs to be addressed in the mitigation section (Chapter 5) and within the compensatory mitigation plan (Appendix M). Include citations to these sections and within these sections, discuss temporal loss of	

			may return over the span of 40 to 60 years or more as the insulating organic mat recovers allowing the permafrost to reestablish to shallower depths (Post 1996).	resources.	
3.11.3	19	KW	Figure 3.11-6A	Modification of Floodwater Storage and Water Quality are 2 functions that were ranked as high for the mine site. Kuskokwim River Wetlands Study Area 3.11.3.2.2 – so what are the deposition and erosion rates from those time periods supposed to tell us about the impacts 3.11-37?	
3.11.4	57	KW	A total of 6,967 acres of wetlands would be directly affected by Donlin Gold's proposed mine (Table 3.11-14).	Also need to include the proposed indirect or secondary impacts to wetlands that was estimated through modeling of impacts from dust, change in surface water distributions and groundwater. As depicted in Table 3.11-23.	
3.11.4	59	KW	Wetlands affected by mine construction seem to include 10 to 35 percent, depending on the function, of wetlands rated as high functioning for hydrologic functions (Table 3.11-15).	What about the collective loss of both low, moderate and high functioning wetlands at the site? Considering EPA's comments on the FA, these results are called into question.	
3.11.4	59	KW	Sediment barriers and erosion control planning would mitigate for loss of this wetland function.	To what extent? Completely mitigate? Please clarify and support this statement with any analyses that were conducted.	
3.11.4	61	KW	Dust emissions generated by drilling and blasting, waste rock and ore loading and unloading, traffic on roads, wind erosion of exposed surfaces and ore processing (Environ 2014a) would be deposited primarily downwind from sources on nearby vegetation and wetlands.	Why is groundwater not summarized in this section as well? Please include impacts to wetlands due to changes in groundwater.	
3.11.4	65	KW	Although growing season conditions may be drier, near surface groundwater from spring runoff and precipitation may continue to support wetlands such that the overall long-term effect of the drawdown on surrounding wetlands are difficult to accurately predict…….All wetlands within this drawdown area are unlikely to be permanently altered; the primary potential for impact is likely to be alteration of hydrologic functions, although the level of this potential alteration is unclear.	The analysis represents the wetlands and functions that are likely to be affected by dewatering; however, the conclusions drawn in the last paragraph in 3.11-65 is that there are likely no impacts to wetlands despite the fact that it is still unclear. It appears that all uncertainty in indirect impacts were treated as non-impact. So how were these considered in the final ranking?	
		Bt	Although growing season conditions may be drier, near surface groundwater from spring runoff and precipitation	How was this issue resolved in the mitigation plan? How were the temporal losses due to drawdown addressed?	

			may continue to support wetlands such that the overall long-term effect of the drawdown on surrounding wetlands are difficult to accurately predict.....All wetlands within this drawdown area are unlikely to be permanently altered; the primary potential for impact is likely to be alteration of hydrologic functions, although the level of this potential alteration is unclear.		
3.11.4	70		Lowering the subsurface water table within permafrost-based wetlands may have little effect on surface moisture, especially in flat HGM classes where moisture is primarily received as precipitation; unless there is also an associated collapse in the permafrost from thermal degradation.	How was this potential impact accounted for outside of the citation from the Churchill study that states a possible conversion of wetland? It appears all uncertainty in indirect impacts were treated as non-impact. Clarification is needed.	
	3.11-71	Bt	During reclamation, flat to gently sloping wetlands would generally be reclaimed by removal of fill and grading to recreate original contours and hydrologic regimes.	This is not wetland restoration or mitigation. Donlin should be required to restore these areas as wetlands with similar functions and values to pre-mining conditions. The word reclamation seems to be used interchangeably with mitigation in this wetlands section.	
		Bt	Material sites constructed in valley bottoms, lowland sites, or in black spruce permafrost wetlands could be reclaimed to create new ponds with emergent wetlands where sufficient water quality and hydrology are available.	This statement indicates that there is no plan in place for mitigation. Without a mitigation plan, or even an acceptable conceptual plan there is no way for the regulatory agencies to determine if impacts to WOUS are adequately mitigated. The project should not be permitted until the applicant can demonstrate a plan to replace the functions and values lost due to the project.	
3.11.4	73	KW	Restored wetlands are likely to differ in type and functional capacity from the original wetlands for decades to centuries.	Where are temporal losses to aquatic resources discussed? It should be referenced here. Restored wetlands are likely to differ in type and functional capacity from the original wetlands for decades to centuries. Considering some of these wetlands cannot be restored or re-established, there would be no way to reduce the impact summary rankings regardless of the additional mitigation measures implemented. Discussion on this is warranted.	
3.11.4	73	KW	There is insufficient detail for the equilibrium groundwater level to quantify potential long-term impacts to wetlands.	How did this effect the end ranking? Considering this assertion, duration should err on the side of long-term.	
		Bt		When equilibrium does occur, Donlin should be required to	

				map the wetlands to determine final mitigation requirements. The document currently does not contain information sufficient to determine if WOUS losses will be replaced.	
3.11.4	76	KW	Mitigation Summary	This information should be included in Section 5.6 in Chapter 5 as well.	
	3.11-79	Bt	Table 3.11-22	Many of the projects listed should not be considered, for example 1,000 acres of open water created by the pit lake. The pit lake will have contaminated water which requires treatment in perpetuity which should eliminate it from consideration. Another is removing a natural set of waterfalls in order to allow fish passage. The projects on this list should be carefully considered before even considering them as potential mitigation. The table, and the corresponding table in the conceptual mitigation plan demonstrate that Donlin has no plan in place, or even ideas in place to adequately mitigate project impacts.	
3.11.4	80	KW	Anticipated Alternative 2 mine site direct effects on wetlands would be medium to high in intensity with an observable 21 percent reduction in wetland abundance (Table 3.11-14) and impacts to between 10 and 37 percent of high functioning wetlands (Table 3.11-15)	Why are only high functioning wetlands summarized? Moderate and low functioning wetlands still have importance and provide functions. We request you include them in the summary.	
3.11.4	80	KW	The overall impact of the construction, operations, closure, and reclamation of the mine site for Alternative 2 on wetlands would be considered moderate.	Given the total acreage of impacts, the uncertainty of indirect impacts, the loss of functions during mining, the uncertainty in re-establishing wetland during reclamation and the temporal loss of resources, "several decades to centuries", the overall impacts appear to be major. This ranking should be re-visited.	
	3.11-95	Bt	Wetland vegetation communities would eventually transition back into a community functionally similar to the wetland prior to construction if preconstruction conditions such as elevation, grade, and sooil structure are fully restored.	Donlin should be required to actively mitigate these communities, and use adaptive management in case any of these factors are not restored to pre-construction condition. All of the wetlands functions and values must be restored as a part of active mitigation.	
3.11	98	KW	Effective restoration of floating mat bog and fen areas may not be possible beyond compensation through mitigation banks.	These difficult to restore resources will be difficult to replace through a mitigation bank unless it is preserved. Higher mitigation ratios are warranted. This may be considered a	

				permanent loss of the resource. Clarify this point.	
	3.11-114	Bt	Closure and Reclamation	In this section, and throughout the document the terms reclamation, restoration and mitigation seem to be used interchangeably. The document should be clear in the use of these terms. Only mitigation should count as mitigation.	
3.11.4	119	KW	These effects determinations take into account impact reducing design features (Table 5.2-1 in Chapter 5, Impact Avoidance, Minimization, and Mitigation) proposed by Donlin Gold…	It should be clarified that these impact reducing design features may not be implemented and it is not a guarantee that it would be implemented if the project moves forward. A statement or footnote indicating that fact should be included or clarification should be provided if there are in fact protocols in place to ensure the measures are implemented.	
3.11.4.4	119	KW	Wetland functional assessment data are available for an additional 123 acres of wetlands impacted by portions of the additional airstrips; no functional assessment data were available for the additional 103 acres of wetlands impacted by the 18-mile extension of the diesel pipeline from the Tyonek dock (3PPI 2014b).	Please provide a brief discussion of how the inclusion of those wetlands may have an impact on the impact criteria for this alternative and why.	
3.11	120	KW	Mark wetland boundaries and vegetation clearing limits with flagging or other markers to prevent crews from damaging more vegetation than needed during construction; Use mats or other appropriate types of ground protection to minimize disturbance to ground vegetative cover during non-winter construction; Use large surface area/low impact tires on or near wetlands to help reduce equipment impacts. Use mats or other appropriate types of ground protection to minimize disturbance to ground vegetative cover during non-winter construction;	These appear to be requirements or BMPs, not necessarily a mitigation measure under 404. While these may be appropriate discussion for mitigation under NEPA, these would not be appropriate compensatory mitigation for the loss of aquatic resources under CWA Section 404. This needs to be clarified.	
3.11.4.5	129	cg	69 river miles	Chapter 2 (Section 2.3.5) and Section 3.23 (Transportation) says the reduction is 75 miles.	
3.11.4.5.2	134	cg	69 river miles	Chapter 2 (Section 2.3.5) and Section 3.23 (Transportation) says the reduction is 75 miles.	
	3.11-134	Bt	The port area would be regraded to approximate original contours or acceptable slopes, decompacted, covered with growth media if necessary, and seeded to promote	We recommend that active mitigation of all wetlands be performed as a condition of any permit. Passive mitigation as described here should not be allowed since in many cases	

			vegetative growth. Most flat to gently sloping wetlands would be reclaimed by removal of fill. Fill would not likely be removed in areas where marginal hydrology of wetlands or upland mosaics with wetland inclusions makes restoration of wetlands not feasible.	adaptive management of some kind may be needed. All of these wetlands should be mapped, and mitigated for any loss of functions and values.	
3.11.4.7.1	141	KW	Wetland mapping has been completed for both routes, although siting for camps, access roads, airstrips, and material sites was not available for evaluation.	Is it anticipated that these would likely be placed in uplands as an avoidance measure or is there a chance that additional wetlands may be impacted? Please provide some context. What is the anticipated area needed for these ancillary features based on the Alt 2 route?	
Table 3.11-58	147	cg	69 river miles	Chapter 2 (Section 2.3.5) and Section 3.23 (Transportation) says the reduction is 75 miles.	
3.12 Wildlife					
3.12.5.1.2	109	cg	The 27-mile long road from the proposed mine to the Angyaruaq (Jungjuk) Port site	The Alternative description in Chapter 2 (page 2-7) says this road is 30 miles long.	
3.12.5.	155	CE	While the mercury methylation process is complex, factors that would increase it, such as increases in wetland area or depletion of oxygen in waters, or increases in populations of large resident fish, are not likely to increase with mining operations.	We concur that the mercury methylation process is complex, however, we do not agree that the factors that could affect methylation would not increase with mining operations. While the factors mentioned may not increase, there is expected to be an increase in new mercury entering the system, which may be more bioavailable than older geogenic mercury, and there will also be an increase in sulfate which could stimulate microbial methylation. Because of the complexity of the methylation process, an increase in these two factors does not guarantee that methylmercury will increase; however as the text current reads it does not acknowledge the factors related to the mining activity that could increase methylmercury production.	
3.12.5.2.5	167	cg	Under Alternative 4 the upriver port site would be located at BTC, approximately 60 miles downstream from the Angyaruaq (Jungjuk) Port site proposed under Alternative 2.	Unless 60 is not river miles, Chapter 2 (Section 2.3.5) and Section 3.23 (Transportation) says the reduction is 75 miles.	
3.13 Fish and Aquatic Resources					

3.13	7	KW	OtterTail 2012b	This study is extensively referenced in this Section. The beginning of this Section needs to summarize the study and what it intended to capture and how extensive the study was. Is it only providing habitat suitability indices?	
3.13.2.2.2	65	cg	As shown in Figure 2.3-42 (Chapter 2, Alternatives), the proposed 73-mile long road that would connect the BTC Port site to the mine would be about 43 miles (2.5 times) longer than the 30- mile long road that would connect the Angyaruaq (Jungjuk) Port site with the mine under Alternative 2	The BTC Road would be 76 miles long (so 46 miles or 1.5 times longer)	
3.13	120	KW	While sediment transport and deposition are natural stream processes, major disruptions of the stream system and its functions may occur when sediment delivery is substantially changed or when the ability or capacity of the stream to transport sediment is altered.	Further discussion on the extent to which this would affect the impact criteria ranking should be provided.	
3.13.	122	CE	Surface water concentrations in Crooked Creek watershed could increase, but would remain below Alaska water quality criteria	From 3.7-151 the text predicts that increase in deposition would result in water concentration of 11.6 ng/L; which if rounded up, is at the chronic exposure level of 12 ng/L. If standard deviation, or standard error, or 95% confidence levels were applied to the 11.6 ng/L value, it is certain that the concentrations would be above the Alaska water quality fairly frequently.	
3.13.	122	CE	Concentrations of mercury in fish in the Crooked Creek watershed could increase, but the changes would likely be low (up to 3 percent above current levels) and within the range of regional background fish tissue concentrations.	Important to note that this assumes that there would be no increase in methylmercury production due to increases sulfate loading. As such, this is not a very conservative estimate of the amount of increase in methylmercury levels in fish that might occur.	
3.13.	122	CE	It is anticipated that only a small fraction of the inorganic mercury dispersed from the mine site would be available for methylation (Marvin-Dipasquale et al. 2009).	While this is a correct statement; it should also be mentioned that that while only a relatively small percent of inorganic mercury is likely available for methylation; the fresh sources of inorganic mercury released from the mining activities may have a higher bio availability (albeit a low percentage of the total mercury) compared to older geogenic inorganic mercury in the system.	

3.13.	123	CE	Average methylmercury concentrations in surface waters, however, have been predicted to increase at a medium level of intensity, from 0.280 ng/L to 0.398 ng/L (42 percent increase over the baseline concentration), due to mining activities proposed under Alternative 2 (ARCADIS 2014).	Is the 0.280 ng/L value an average? It is important to note that this is an estimated value and was not measured. The main driver of the generating this methylmercury value was the DOC concentration which was also not measured by estimated using an assumed value of 20 g/L. As such, these concentrations are not "averages" obtained from taking a mean of several values, but estimates obtained from a regression equation.	
3.13	129	LK		With regards to scour, increased draft could increase the impacts of scour. Some consideration should be given to propulsion design of vessels.	
3.13.3.5.2	173	cg	barge traffic from Bethel would travel about 99 miles upriver to the BTC	BTC is 124 river miles from Bethel (page 2-152)	
3.13.3.5.2	173	cg	the BTC Port site but would not be required to travel the additional 69 miles to the Angyaruaq (Jungjuk)	Chapter 2 (Section 2.3.5) and Section 3.23 (Transportation) says the reduction is 75 miles.	
3.13.3.5.2	174	cg	This 73-mile long road would be about 43 miles (2.5 times) longer than the 30-mile long road proposed under Alternative 2	Page 2-152 says the BTC road is 76 miles long which would make it 46 miles or about 1.5 time longer than the 30 mile road in Alt 2	
3.13.3.5.2	174	cg	(Alternative 2 would require 5 bridges and 45 culverts).	Page 2-53 says that there will be 51 crossings under Alternative 2 with 6 bridges.	
3.13.3.5.4	175	cg	the upriver extent of barge traffic on the Kuskokwim River would be reduced by about 69 miles	Chapter 2 (Section 2.3.5) and Section 3.23 (Transportation) says the reduction is 75 miles.	
3.13.3.5.4	175	cg	Also, compared to Alternative 2 there would be 10 fewer stream crossings	Since Chapter 2 says there are 51 crossings under Alternative 2 and 40 under Alternative 4, the difference is 11	
3.13.3.5.4	175	cg	a roadway that would be 43 miles longer	The roadway would be 46 miles longer	
3.14 Threatened and Endangered Species					
No Comments					
3.15 Land Ownership, Management, and Use					
3.15.3.7	55	cg	Table 3.15-11	Rather than calculate the percent difference by dividing the numeric difference by the new value (21/34), it should be	

				divided by the original value: 21/13 = 1.62 or 162% 10.5/4 = 2.63 or 263% 18.9/10.5 = 1.8 or 180% 29.5/14.5 = 2 or 200% See Table 3.16-7 for correct figures	
3.16 Recreation					
No Comments					
3.17 Visual Resources					
No Comments					
3.18 Socioeconomics					
General Comments					
Pre-Mature Mine Closure Scenario	MJ	Due to market fluctuations in gold commodity prices, it is appropriate to evaluate a scenario where the Donlin Gold Mine Project may close unexpectedly, either temporarily or permanently, prior to the planned 27.5 years of active mine life. We recommend the EIS evaluate the environmental and social impacts associated with a low probability, high consequence event of a premature mine closure. The EIS should disclose the basis for a premature mine closure (e.g., higher than anticipated operating costs, low production, or low commodity prices). We recommend that the EIS describe potential scenarios for premature mine closure and implications for the mine site facilities, such as the open pit, WRF, TSF, and the transportation infrastructure, and the pipeline. We recommend the EIS evaluate different scenarios for premature mine closure during different timelines (e.g., 10, 15, and 20 years) of the mine life and post closure. The EIS should describe the management measures and procedural controls that would be implemented to reduce erosion and manage containment of surface and groundwater contaminants and ensure a sustainable closure. A monitoring plan should be implemented during a temporary and/or permanent mine closure at different timeline scenarios.	
Closure Social Impact Assessment	MJ	We recommend that the EIS discuss the socioeconomic impacts associated with a premature mine closure to determine the overall impacts to individuals, communities, and the regional economy. The DEIS indicates that a Closure Social Impact Assessment (CSIA) would be an important component of the proposed project closure plans and would outline measures with potentially affected communities to manage a tapered economic decline. As part of a premature mine closure scenario, we recommend that a preliminary CSIA be included in the EIS. The CSIA should be developed with active and meaningful engagement from the local communities. In addition, we recommend that the CSIA be reevaluated at five-year intervals in order to gauge the project benefits and community needs on a more routine basis and make changes to benefit the outcome that would be coincident with project operations. This would also assist the communities in the event of	

		unplanned temporary closure or pre-mature mine closure and/or abandonment.	
Financial Assurance	MJ	We recommend that the EIS discuss how a premature mine closure would affect financial assurance for closure and reclamation and payments to establish the Donlin Gold Trust Fund for long-term monitoring (Appendix A). We recommend disclosure of the FA estimates that would be available during the timeframe of the premature mine closure scenario and whether the FA amount would be sufficient to cover the costs of properly containing, reclaiming, and/or closing the mine facilities. It is our understanding that models have been used to evaluate the financial assurance estimates during different timeframes of the active mine life.	
3.19 Environmental Justice			
General Comments Demographics	RG	The demographic profiles are in line with Executive Order 12898 and the CEQ guidance. These are foundational Environmental Justice (EJ) documents, but do not represent all of the possible guidance and methodology available. Other EJ documents should be identified and referenced in the EIS. The DEIS makes use of and cites references to other EJ guidances, laws and recommended best practices that are relevant to EJ analysis and implementation, such as Children's Environmental Health, Sacred Sites, Tribal Consultation, best public engagement practices for EJ and Permitting and EJ and NEPA; and other guidances and best practices from other agencies and academic sources. For example, ADEC received an EPA grant to develop a tribal protocol for APDES permitting. The analysis suggests, for Alternative 1 (No Action), that there is an EJ concern based on the economic impact of discontinuing Donlin Mine work thus far. An EJ determination is based on more than just a single factor—in this case economics. If other factors are considered, they might suggest that the costs of Alternative 1 (No Action) - not going forward with the mine - would not result in environmental justice concerns but actually provide and/or maintain existing overall benefits to the communities. Further, from an environmental justice perspective, the development that results in projected benefits of the kind advanced is *sustainable, community driven development.* The analysis should explain how the project fits the description of and meets commonly understood principles of sustainable, community driven development. In the absence of a description, the position that Alternative 1 would pose an environmental justice related impact of any kind is untenable. The section on socio-economics characterizes the socio-economic impacts of Alternative 1 to the Yukon Kuskokwim region as "minor" and to regions outside that area as "negligible." We recommend cross walking the sections to minimize inconsistencies and avoid contradictory conclusions. Also, provide an economic analysis that confirms disproportionate economic impact of Alternative 1 (No Action). For example, include an analysis of disposable income and categories of spending in community—how much to subsistence support—which is claimed as a benefit in the document-- and the impact on subsistence harvest; the ability of the community to replace or substitute cash economy with other forms of economic activity to cover needs (i.e. level of economic, social and cultural resilience in community).	
Vulnerability and	RG	The EIS makes available in the analysis a discussion of factors that make segments of the population vulnerable or sensitive	

Health Impacts		to a variety of impacts such as children, elderly, those with compromised immune systems, and those along the unique exposure pathways such as those engaged in subsistence activities and exposures to workers. We recommend that the Health Impact Assessment be included in the EIS. The EIS should also include research and analysis that illustrates understanding of the health impacts of stress, diminishment or loss of cultural resources.	
Cumulative Impacts	RG	The DEIS makes the assumption that a cash based economy is preferable and that it can be compatible with a subsistence and other forms of economic activity. We recommend that the EIS provide a focus of cumulative impact analysis around transitioning a community from a subsistence economy to a cash economy. There is both research and experience to be able to assess the costs and benefits and over all impacts for people making this kind of a transition directed from a place other than their own direct agency. We recommend evaluating the health impacts of transitioning entire traditional communities from a subsistence economy to a cash based economy.	
Tribal and Public Engagement	RG	Tribal and public engagement does not stop with, or is limited to the submission of comments and the one-way transmission of information from any one source to passive audiences. Tribal and public engagement also includes applying the lived and dynamic experiences of people—creating new knowledge and deepening the empowerment of community members—over the course of time. The end goal of meaningful public involvement, from an environmental justice perspective, is community empowerment. The sense of individual and community agency and empowerment is a social determinant of health. This is consistent with the definition of health ascribed to in the document. A project should aim to strengthen the social determinants of health while accounting for any erosion of them. We recommend that there be more proactive and collaborative interactions with the communities in areas such as monitoring, creating and sharing data over the course of the active and closed periods ("in perpetuity") of the mine, and the ability to meet the demands of changing conditions with communities as partners.	
Mitigation	RG	There are many opportunities for empowering communities. We recommend involving communities in designing and implementing mitigation measures, strategies, and plans. Communities should also be involved with monitoring of the mitigation to ensure success in reducing project impacts. There is also a need to ensure that communities have the capacity to participate in making decisions regarding mitigation that would shape their lives. We recommend that the mitigation strategies and plans include building community capacity and specify the actions taken and to be taken during the project.	
3.21 Subsistence			
General Comments			
810 Analysis	MJ	We have concerns that the DEIS environmental analysis under NEPA and BLM's preliminary subsistence findings under ANILCA §810 are not consistent. According to the BLM, the ANILCA §810 findings were based on the information and analysis in the DEIS. As recommended previously, the environmental analysis and the summary impact ratings for subsistence should be reevaluated in the EIS to ensure consistency with agency findings. We recommend that the EIS resolve the inconsistencies between the subsistence summary conclusions in DEIS and BLM's ANILCA §810 findings.	
Alternatives	MJ	To address the issues regarding potential restrictions to subsistence users and resources, we recommend that the EIS	

			evaluate different alternatives, modify the proposed action, and/or incorporate additional design features, mitigation measures, and BMPs. For example, in order to reduce the potential spill risks and impacts from increased river barging on the Kuskokwim River, we recommend incorporating components and subcomponents of Alternatives 3A and 3B into the preferred alternative for the EIS. Both alternatives would reduce the number and frequency of fuel barges on the Kuskokwim River during operations.		
Farewell Airstrip		MJ	We recommend eliminating the use of the proposed airstrip at Farewell, which may increase access to non-local hunters and result in more competition of subsistence resources to the local community. The EIS should consider other locations for the airstrip, further away from subsistence communities, to access the pipeline ROW and/or evaluate additional gravel access roads and/or ice roads.		
Mitigation Measures		MJ	We recommend that the EIS analyze additional mitigation measures to minimize impacts to subsistence resources and users. We recommend that the EIS include a commitment by the project proponent to work actively and engage the local communities on opportunities to improve access to subsistence resources during the active life of the mine. For example, a local subsistence board could serve to advise the project proponent of potential conflicts with access to subsistence uses and recommend improvements to mine operations that would avoid and minimize subsistence conflicts.		
Subsistence Plan and Report		MJ	We recommend that the EIS include a commitment to develop a Subsistence Users and Resource Plan, which would include best management practices for the mine operations to improve subsistence activities and avoid potential conflicts. The plan should also include monitoring of mine activities to ensure that subsistence resources are adequately protected throughout the active mine life and post-closure. We recommend that a Subsistence Report be developed with input from the local subsistence users. The Subsistence Report should include an adaptive management framework where certain monitoring activities may no longer be needed, but additional monitoring may be required based on the results of previous years' activities. This report should be presented to the subsistence communities for review and comment. Finally, the EIS should actively involve the local communities to support regional planning and implementation for the prevention, monitoring, and response to accidental spills of fuel, cyanide, mercury, and mine tailings to protect subsistence resources.		
3.21	2	LK		The EIS should provide a more detailed analysis of how Alaska Natives would receive economic benefits from gold mining activities. What are the requirements of jobs that would be available to ANs? What are the current abilities of ANs to function in those jobs? If there are deficits in the ability of ANs to fill these jobs, what training would be needed? Has there been an effort to determine whether or not ANs would want to take these jobs, including whether changes in lifestyle would be acceptable? Has the amount and dollar value of subsistence resources lost by habitat alteration been evaluated?	

3.21.5.1	18	LK		How will pipeline construction affect lifecycle aspects (e.g. migration, breeding, etc.) of subsistence food resources (e.g. caribou, moose, etc.). What information is available for specific animal populations? Village harvest areas overlap areas with pipeline construction in several cases (e.g. Nikolai, Figure 3.21-4; Stony River, Figure 3.21-7; Crooked Creek, Figure 3.21-16) Information on harvest areas and impacts of aspects of the proposed Donlin Mine are not available for many villages that could be impacted by the project. These communities should be identified. The reason for selecting the representative communities should also be identified. Ostensibly, those most impacted by Donlin project activities should be selected.	
3.21.6.1.2	127	LK		Need to review assumptions about contaminant concentrations and toxicity to birds as well as bird behavior as a function of water depth.	
3.21.6.3.2	155	LK		More information should be presented on the impacts of barge traffic on large land mammals (e.g. moose). This analysis should specifically discuss displacement of large mammals from river corridors where hunting frequently occurs.	
3.21.6.3.2	156	LK		The impact of bed scouring on fish spawning areas should be discussed in greater detail. In addition to vessel speeds are there other operational changes that might be implemented, for example limiting barging during spawning season.	
3.21.6.3.2	167	LK		The impact of barge traffic on fishing activities involving nets should be discussed to a greater degree.	
3.21.6.3.3	169	LK		The impacts of other pipeline construction projects on large mammal populations should be reviewed and cited here. Specific animal and bird populations with areas of aggregation (e.g. nesting or grazing areas) affected by the pipeline should be identified and impacts on their populations discussed	
3.21.6.6	189				

		cg	Table 3.21-26	This Table is exactly the same as Table 3.23-15 except for the 253% - 153 is correct	
3.22 Human Health					
General Comments					
		JS	The inclusion of a health section within an EIS that is appropriately scoped to include the range of important health issues related to the project is a commendable endeavor, and a suggested mechanism by the National Research Council to support health (http://www.nap.edu/read/13229/chapter/1). The framework for the analysis is consistent with HIA practice, but does not include all of the typical HIA components. A scoping phase was completed to focus the review on those health outcomes most likely to be impacted and/or topics of concern the potentially impacted communities. Community stakeholder meetings were held to engage and capture concerns. The analysis of the impact and of the identified alternative plans was completed and presented in the EIS. Missing from the EIS, but part of typical HIA frameworks are recommendations for how to mitigate identified negative health impacts or accentuate positive health impacts. Similarly, the EIS does not mention how reporting or evaluation of the HIA will be completed. It is unclear how the completed HIA that could include these additional sections will interact with the EIS. It is conceivable that additional recommendations may come out of the HIA. The health analyses could be strengthened with improvements in identifying evidence (references) to support statements and improvements in defining units within the tables. Additionally, what is included within the health analysis and what is excluded is not always clear. For example, the analysis for cancer, chronic diseases, and cardiovascular disease focused primarily on chemical/pollution exposures when other risk factors for influencing these diseases, e.g. food and recreational physical activity are acknowledged to be modified by the project. Similarly, tobacco use is an important risk factor for these disease; while changes in other substances are analyzed, but tobacco use is not.	
Cumulative Effects		MJ	Since the HIA was not included in the DEIS for public review, we are not certain how cumulative effects have been evaluated for human health. We recommend that the cumulative effects of multiple sources, pathways, and exposures from past, present and reasonably foreseeable future actions, including mine operations and accidental chemical spills, to humans be evaluated in the EIS. We recommend conducting a risk based assessment to evaluate all potential sources, pathways, and routes of human exposure to contaminants from air, water, and subsistence foods. We recommend that the EIS describe the acceptable limits for contaminant exposure to subsistence foods and water. In addition, we recommend conducting biological monitoring of human health to evaluate the cumulative impacts during the active mine life and post closure.		
3.22	3.22-1	MJ	The HIA is still under development…	The Alaska Department of Health and Social Services (ADHSS) is developing a Health Impact Assessment (HIA) for the Donlin Gold Project. We recommend that the draft HIA be distributed for tribal, public and agency review and comment. Public outreach and information should be provided to the local communities regarding the results of the HIA. We recommend that the publicly reviewed and, if necessary,	

				revised HIA be incorporated into the EIS. The HIA was not included in the DEIS. We have concerns that the health information and analysis in the DEIS may be inconsistent with the findings of the HIA. The EIS should identify mitigating measures to minimize adverse health impacts and disclose how reporting and evaluation of the HIA would be completed. We encourage the project proponent to continue the partnership with the State of Alaska on the Donlin Gold Project HIA. We recommend that the HIA be reevaluated every five to ten years during the active mine life and post closure to include new data, information, research and studies regarding the health of the native communities in the middle-Kuskokwim River region. As part of their corporate responsibility, we encourage the project proponent to actively engage and work with the local communities to monitor, sample, and test subsistence foods for mercury and other contaminants to ensure protection of human health.	
Tables 3.22-2 3.22-4	11	JS		National data should be available for many of these demographic factors, yet are not in the column.	
3.22.3.4.3	3.22-19	MJ	ADHSS Mercury Biomonitoring (2002 – 2010)	The ADHSS has implemented a statewide hair mercury bio-monitoring program to collect information about mercury exposures among women of childbearing age. We encourage the project proponent to partner with the State of Alaska and the local communities to continue the bio-monitoring program throughout the active mine life. The hair mercury bio-monitoring program should be expanded to include infants, young children, and the elderly. The EIS should include a commitment by the project proponent to support additional mercury bio-monitoring efforts in communities along the middle-Kuskokwim River region with active engagement and involvement from the native communities.	

				Screening levels or thresholds, based on the EPA reference dose for mercury, should be established to determine whether or not further monitoring would be required after adaptive management.	
3.22.3.4.3	19	LK		There should be a detailed assessment of existing data on baseline levels of arsenic, antimony, and mercury in soil and water. There should also be an assessment of existing data on baseline levels of mercury and inorganic arsenic in fish. The adequacy of, and need for additional, data on mercury in environmental media should be assessed in relation to needs for modeling of mercury environmental fate, transport and subsequent bioaccumulation. It is very important that adequate baseline data are obtained before mine construction begins.	
3.22.3.4.3	19	LK		Native Alaskan's hair methylmercury (MeHg) concentrations and the hair MeHg concentration associated with the EPA reference dose (RfD), 1 PPM, should be used in this analysis rather than the NOAEL of 15.3 PPM, a follow-up value of 5 PPM, or a hair concentration of 3.4 PPM (obtained by dividing ATSDR's NOAEL by an uncertainty factor of 4.5). The NOAEL does not account for uncertainties and variability associated with MeHg's health impacts. EPA's RfD analysis is more current than ATSDR's and is supported by a review by a research committee of the National Research Council of the National Academy of Science. EPA believes that derivation of a regulatory methylmercury toxicity value using the Faroe Island data set, which showed a dose response relationship, is a better choice than use of the Seyschelles Island data set, which showed no dose response relationship. Further, EPA believes that a benchmark dose approach, utilizing the information in the dose response curve, is superior to utilizing a NOAEL as the point of departure for RfD development. EPA's Integrated Risk Information System (IRIS), in presenting the derivation of EPA's MeHg reference dose, suggested that the point of departure upon which the MeHg RfD is based, a lower limit on the benchmark dose of 10 ppm, be divided by	

				an uncertainty factor of 10. This uncertainty factor considers inter-individual variation and uncertainty in both MeHg dose response relationships (i.e. toxicodynamics) and transport and fate within the body (i.e. toxicokinetics). The IRIS methylmercury RfD derivation notes that that significant hair methyl mercury dose response relationships were observed using data from Faroe Island residents with hair MeHg levels of less than 10 ppm, supporting use of an uncertainty factor. Public health agencies may consider both adverse health effects and benefits associated with MeHg exposure. Specifically, fish consumption results in adverse health impacts due to MeHg toxicity, but also in the positive health impact of high quality protein and beneficial fish oil intake. Additionally, there are positive psychological and cultural aspects of subsistence fish harvest precluding consumption. In the case of introduction of mercury alone into the environment, there is no offsetting benefit, and a public health approach incorporating benefits is inappropriate. The MeHg RfD should thus be the endpoint of comparison for Native Alaskan hair MeHg levels.	
	3.22-20	JS		Page 3.22 –20 ADHSS, Hair Mercury Monitoring (2012) in Potentially Affected Communities. The lowest dose of MeHg that impairs neurodevelopment in the human species is not known, Myers GJ. (1995) Main neurodevelopmental study of Seychellois children following in utero exposure to methyl mercury from maternal fish diet: outcome at six months. *Neurotoxicology*, 653. In the EIS table 3.22-6; Summary of Data Collected by Gender, Donlin Gold, 2012 the age range of the female population tested was 15-74 years. The data analyses are based on this population. What number of the women who had their hair mercury tested were of childbearing age? What conclusions can we draw from this subset of the women? It should be made clear that women who are not of child bearing age and men are not at risk here and comparing them in any way to the sensitive subset of women of child bearing age has no meaning.	

3.22.3.4.4	3.22-21	MJ	HEC 4: Food, Nutrition, and Subsistence Activity	For the middle-Kuskokwim River area, the ADHSS has issued fish consumption advisories for mercury in burbot and pike. The DEIS indicates that mercury concentrations in fish tissue could be up to three percent greater than current levels, and would be associated with an increase in mercury from fugitive dust and stack emission sources from the Donlin Gold Project. We have concerns that the actual mercury concentrations in fish tissue may be greater than the modelling results would suggest. We recommend that the EIS include a human health risk assessment for mercury to determine whether the estimated percent increase in fish tissue concentrations is within acceptable limits for human exposure and consumption. We recommend that the EIS disclose the limits for human consumption and exposure to mercury and that screening levels or thresholds be established to determine whether or not further monitoring would be required after adaptive management. Furthermore, we recommend long-term monitoring and fish tissue testing for mercury in the middle-Kuskokwim River area throughout the active mine life. We recommend that the EIS include a commitment for the project proponent to partner with the State of Alaska and the local communities to develop and implement a subsistence fish biological monitoring program and mercury biomonitoring for other sources of subsistence foods (e.g., birds, eggs, berries, and wildlife).	
	3.22-22	JS		For STIs – page 3.22-22 – having a chlamydia be 89.4% of reported infectious diseases is not reflective of comparable incidence to infectious diseases in general because most infectious diseases are not reportable. This could be better framed with the comparison only to other reportable STIs.	
Table 3.22-8	3.22-23	JS		Has subsistence activity in the title, but it is not in the table. Definitions for food security levels are needed. Some explanation is needed for Stony River's food basket costs (125% of median income) and how that community works. It could indicate that this type of analysis may have limitations for these communities.	
	3.22-24	JS		reports cancer rates. It appropriately identifies the limitation	

				that the rates are unstable with low numbers, but the analysis still includes rates with decimal places, which implies much higher precision than is possible.	
	3.22-24	JS		Mental health data is stated to be from the 2008-2010 BRFSS, but the reference used is from 2009. It is unclear how a reference published in 2009 could have included 2010 data. This reference is used in other places within the document, including the following section on diabetes rates.	
	3.22-26	JS		Hospitalizations. Inpatient days (reported) are different than the number of hospitalizations. While hospitalization days may be important from a health care services standpoint, the number of hospitalizations from a particular disease would better characterize the relationship between rates of serious illness. Tobacco use – Impact on alcohol and drug use/abuse is discussed, but the impact on tobacco use is not discussed later in the analysis section despite acknowledgement that it occurs more frequently in the impacted communities.	
Figure 3.22-3	3.22-27	JS		is not readily interpretable.	
	3.22-34	JS		Climate change section asserts a contribution to declination in moose and salmon. These statements would be better supported with a reference documenting the relationship.	
	3.22-35	JS		"Health consequences related to changes in environmental conditions e.g., air quality, water quality, bioaccumulation in foods, are subject to modeling uncertainties. While the concentrations of chemicals under the baseline conditions may be known, future concentrations (e.g. as related to end-of-mine life, post closure) are estimated by using intentionally conservative modeling approaches. This approach is likely to overestimate the consequences of potential exposure to hazardous substances and is consistent with accepted regulatory approaches to evaluate chemical exposures." Where in the EIS can the modelling performed and referenced here be found? It should be referenced here.	
3.22.4.2.1	38	LK		EIS should provide a more detailed analysis of how Alaska Natives would receive economic benefits from gold mining	

				activities. What are the requirements of jobs that would be available to ANs? What are the current abilities of ANs to function in those jobs? If there are deficits in the ability of ANs to fill these jobs, what training would be needed? Has there been an effort to determine whether or not ANs would want to take these jobs, including whether changes in lifestyle would be acceptable?	
	3.22-39	JS		The statement that increases in economic opportunities could result in an increase in the number of individuals investing in education would be better supported with a reference. The statement that economic opportunities will provide better support access to health care could use some additional explanation in light of previous discussion about distance and lack of health care providers being the most significant barriers. The range (20-1900) of households associated with expected employment opportunities is quite large. There may be a typo in the number.	
	3.22-39 to 42	JS		Pages 3.22 - 39 – 42, Social Determinants of Health Psychological Stress, Rates of Substance Abuse, Family Stress and Instability. "Based on regional hospital data in Bethel, the leading causes of impatient days were alcohol abuse, psychoses, pneumonia, and child birth," page 3.22 – 26. "The Bethel Census Area is designated as a Medically Underserved Area (MUA) and the Health Professional Shortage Area (HPSA) is 11." page 3.22 – 26. " There is also the potential for increases in psychosocial stress in the potentially affected communities, related to fear of changes in lifestyle and cultural practices, land encroachment, impact to natural resources,…and food security and quality." "The addition of new stressors…could potentially worsen existing metal health conditions…" Also, "in other places where the number of people have been employed at past and present mine sites the disposable income led to noticeable increases in drug and alcohol use…" page 3.22 – 41 In addition, "community interviews for other mine projects suggest long-term fly-in, fly-out work rotations can contribute to stress and instability in	

				families." Page 3.22 -42. And although a benefit "may be noticeable in terms of being able to afford increased and faster access to and utilization of healthcare," the reality is that the existing health care capacity for mental health, substance abuse treatment, and family counselling are currently completely overwhelmed. Any additional stress to the system would have more than a medium health effect as defined as "minor benefit or minor injury that may not require intervention and the intensity of the impact would be low," page 3.22 – 42. The social determinants for health for Health Psychological Stress, Rates of Substance Abuse, Family Stress and Instability need to be re-evaluated taking into account a health system that is completely overwhelmed with current need and likely will be unable to absorb any additional workload.	
3.22.4.2.3	53	LK		There should be evaluation of antimony as well.	
Figure 3.22-4	55	LK		The chapter should specifically present the analysis of air levels of concern and why Donlin doesn't exceed them.	
Figure 3.22-4	55	LK		Results of quantitative analysis must be presented to support findings of insignificance. It is suggested that quantitative risk assessment procedures be employed with documentation of how exposure is calculated. In particular, there needs to be rigorous analysis of mercury releases to the environment with subsequent bioaccumulation in aquatic organisms.	
	3.22-58	JS		The reference or data to the ambient mercury modeling would improve the analysis. CSM analysis. The completed pathways for hunter/forager were not extensively addressed.	
3.22.4.2.3	58	LK		Modeling of air emissions should be reviewed. Missing is a discussion of deposition of mercury and subsequent bioaccumulation.	
3.22.42.3	59	LK		Derivation of predicted water concentrations should be reviewed. What type of monitoring will be implemented?	
3.22.42.3	60	LK		Procedures for minimization of ground water impacts should	

				be reviewed. What about accidental releases from tailing pond facilities or releases to ground water? What type of monitoring will be implemented?	
3.22.42.3	60	LK		Water treatment processes to attain AWQC should be documented and the feasibility of implementing them should be discussed. A modeling approach to evaluate whether or not the mercury tissue criterion is met should be evaluated. The health protectiveness of the mercury tissue criterion should be evaluated in light of the fish consumption practices of Alaska Natives.	
3.22.42.3	60	LK		What about modeling Hg air deposition and subsequent methylation and bioaccumulation?	
	3.22-61	JS		Under Construction states, "There is no consumption of groundwater within the mine site area by local communities. Offsite migration of contaminated groundwater would not occur since the onsite ground water would be captured and treated to AWQC prior to discharge to Crooked Creek."	
3.22.42.3	61	LK		The discussion of ground water movement and conclusions about protectiveness to be critically reviewed.	
	3.22-62	JS		Under Operation and Maintenance says "ground water would be captured and treated on site." And under Closure, Reclamation, and Monitoring, " on-site groundwater that requires storage and treatment would be captured and remain onsite." It would be helpful to reference here where in the EIS is the manner in which groundwater will be collected, treated and discharged (or not) described.	
3.22.42.3	62	LK		Why is it unlikely that shallow groundwater will not be used for drinking?	
3.22.42.3	63	LK		The derivation of the ADEC soil levels should be presented and reviewed relative to EPA risk assessment approaches and site specific conditions.	
3.22.42.3	63	LK		The derivation of the incremental risk posed by arsenic needs to be clearly presented.	

3.22.42.3	64	LK		The non-cancer hazard of arsenic should also be discussed.	
3.22.42.3	64	LK		This section should mention Pike, for which there is already a fish consumption advisory associated with mercury contamination.	
3.22.42.3	64	LK		Arcadis' analysis of fish tissue mercury uptake as a result of mining operations should be critically evaluated.	
3.22.42.3	66	LK		The comparison of mercury hair results should be to the hair mercury concentration associated with the EPA reference dose of approximately 1 ppm, not the ATSDR value.	
3.22.42.3	67	LK		What about contaminant movement from ground water to surface water?	
3.22.42.3	73	LK		There should be better documentation of the potential for Alaska Natives to work on the mine.	
	3.22-74	JS		Access to Quality of Subsistence Resources states, "The effect of the project on subsistence activities suggests that the net benefits may be realized since increased incomes would make procurement of hunting and fishing equipment more affordable and the actual area of impact related to the project activities is limited to a few square miles within the context of a much larger area of available natural resources." There are a number of assumptions made here. The assumption that the impact on subsistence from the project would be limited to the footprint of the project is unbelievable. Food security analysis. The underlying assumption that economic activity will provide improved access to better nutrition could be better supported, and the support would be best if it drew upon studies specifically in communities with high rates of subsistence food gathering/consumption. Additionally, the outcome of "decrease in region food cost as a percentage of median income" appears less relevant in places where subsistence/traditional food gathering practices account for a substantial proportion of calories/nutrition. STI analysis. It would be better supported if evidence existed that showed that having a mix of rotating workers and local	

				workers in an area that already has higher than state rates of STIs would not result in more STIs. The statement that those affected could adapt to the impact by obtaining medical care is somewhat at odds with previous analyses showing difficulty obtaining medical care. Furthermore, while chlamydia may be treatable, the high prevalence of STIs may indicate behaviors that increase the likelihood of transmission. Other STIs could blossom in this environment. For all of the infectious disease analyses, some discussion about the type of housing and quarters at the mine site and how it facilitates or prevents disease transmission would strengthen the ability to make conclusions about infectious disease rates.	
3.22.42.3	74	LK		Scour damage to fish spawning areas and impacts of barge traffic on nets need better characterization.	
3.22.4.2.11	97	LK		With regards to monitoring of mercury in fish, it will be important to develop a robust baseline data set.	
Table 3.22-27	104	LK		Modification of waste such that active measures in perpetuity were no longer needed to contain hazardous chemicals would be highly desirable.	
3.23 Transportation					
No Comments					
3.24 Spill Risk					
3.24.3	3.24-12	MJ	Spill Frequency and Volume	According to the DEIS, spill frequency and volumes are qualitative assessments based on the rate or frequency of occurrence, which includes factors, such as operating procedures, personnel training and awareness, maintenance, and human error. We recommend that the spill frequencies and volumes evaluated in the DEIS be based on real spill incidents that have occurred at active mine sites and/or other industrial facilities in Alaska, the United States, and abroad. The frequency and volume of reported spills and spills at	

				regulated facilities in Alaska should be discussed in the EIS. For example, in May 2010, a cyanide water spill of over 300,000 gallons occurred at the Fort Knox Mine due to a failure in the automated process control system. This example of a real spill scenario should be used in the spill risk analysis for cyanide. In addition, we recommend that the EIS include actual spill frequencies and volumes associated with incidents from ocean vessels, river barges, tank farms, and tank trucks, and other mining and industrial facilities. The Alaska Department of Environmental Conservation (ADEC), Division of Spill Prevention and Response maintains a database of reported spills and spills at regulated facilities. ADEC issues an annual summary of oil and hazardous spills for Alaska.	
Table 3.24-3	18	cg		No units are provided for volume	
3.24.5	3.24-38	MJ	Spill Scenarios	In Southwest Alaska, there are no industrial operations at the scale of the proposed Donlin Gold Project. We have concerns that the area is remote and no infrastructure exists and the capacity for responding to spilled substances is very limited. Due to Federal and State regulations, statewide capacity for oil spill response is well established. However, there are no similar spill response requirements for the response of spills for LNG, cyanide, mercury, and mine tailings. Due to the gaps in response capacity, we recommend that the EIS include a commitment for the project proponent to work with the local communities to develop regional response capabilities and response plans for accidental releases and spills of LNG, cyanide, mercury, and mine tailings. Spill response planning should include, training local responders, engaging in community response exercises, prevention, and monitoring. The location and type of pre-deployed response and clean up equipment should be identified in the EIS.	
3.24.5.5.2	44	cg	It is probable that there could be 10-mile or longer stretches without valves.	Are these automated or manual valves	

3.24.6.4	3.24-64	MJ	Climate and Meteorology	The DEIS evaluates the impacts associated with low probability, high consequence spill scenarios with an ocean barge rupture at sea, river barge release, tank farm release, tanker truck release, diesel pipeline release, LNG release, cyanide release, mercury release, and a partial tailings dam failure. We recommend that the spill scenarios be qualitatively and quantitatively evaluated in the EIS as they may represent a potential contribution to GHG emissions and climate change impacts, particularly spills of diesel fuel from barges, tank farms, trucks, and pipelines.	
3.24.6.2.4	64	cg	The BTC Road would be approximately 2.5 times longer than the mine access road proposed under Alternative 2.	The BTC is only 1.5 times longer than the Jungjuk road.	
3.24.6.6.4	76	cg	The risk of a tanker truck release would be increased because of the increased one-way haul distance of 75 miles, as compared to 30 miles under Alternative 2.	Chapter 2 (Section 2.3.5) and Section 3.23 (Transportation) says the road is 76 miles long so the increased haul distance is 46 miles not 75.	
3.24.6.6.4	76	cg	risks from a tanker truck release under Alternative 4 would be approximately 2.5 times larger than those exposed under Alternative 2 as a result of the longer BTC Road	If the 2.5 times larger risk is predicated on the road being 2.5 times longer, then the risk should be 1.5 times because the road is only 1.5 times longer.	
3.24.6.8.4	112	cg	The risk of a tanker truck release would be increased because of the increased oneway haul distance of 75 miles, as compared to 30 miles under Alternative 2.	Chapter 2 (Section 2.3.5) and Section 3.23 (Transportation) says the road is 76 miles long so the increased haul distance is 46 miles not 75.	
3.24.6.9.4	116	cg	The BTC Port road would be approximately 2.5 times longer than the road proposed under Alternative 2.	The BTC is only 1.5 times longer than the Jungjuk road.	
3.25 Pipeline Reliability and Safety					
No Comments					
3.26 Climate Change					
General Comments					
Scope of Analysis		MJ	The DEIS includes quantitative GHG emissions for the proposed action but does not include quantitative estimates of GHG emissions for the alternatives (3A, 3B, 4, 5A, and 6A). We recommend that the EIS quantify the direct and indirect GHG emissions for the action alternatives and for each phase of development (e.g., construction, operations, maintenance, closure and reclamation). Also, we recommend that the Comparison of Impacts by Alternatives (Table 3.8-33) summarize		

		the GHG emissions for the proposed action and each alternative. We recommend that the EIS include a detailed inventory of the direct and indirect, emissions of each individual contributing source (e.g., mobile, stationary and fugitive) and the respective quantitative emissions from each project phase. We recommend that the scope of analysis for the climate change impacts of the proposed action include all emissions sources (fugitive, mobile, and stationary) from river barges and ocean vessels, air and land transportation, heavy equipment, and aboveground facilities that support the construction, operations and maintenance, and closure and reclamation of the Donlin Gold Project (mine site, transportation facilities, and pipeline). In particular, we recommend that the EIS include the GHG emissions from air and ocean barge transportation of fuel and cargo from the lower 48 United States (Seattle, Washington) and Canada (Vancouver, British Columbia) to the mine site. The proposed expansion of the fuel storage and marine ports at Bethel and Dutch Harbor are considered connected actions in the DEIS. We recommend that the EIS include an analysis of GHG emissions from these connected actions. We also recommend that the analysis include the GHG emissions associated with the final purification of the gold doré bars and transportation to the refinery.	
Carbon Sources and Storage	MJ	The CEQ revised draft guidance definition of "emissions" includes releases of stored GHGs as a result of destruction of natural GHG sinks such as forests and coastal wetlands, as well as future sequestration capability. The biological resources in the project area may represent substantive storage, and/or sinks (sequestration) for GHGs. When biogenic resources are disturbed during project construction and/or operations and maintenance, these carbon storage or sink areas become sources of carbon emissions. Whereas, during closure at the end of mine life, reclamation of disturbed aboveground facilities may result in the conversion of a carbon source to carbon storage or sinks. We recommend that the EIS quantitatively and qualitatively evaluate the carbon storage and sequestration capacity of the biogenic resources for the No Action Alternative. This information would serve as a baseline to compare the carbon storage and sequestration capacity of the No Action Alternative against the proposed action and the action alternatives. For example, the DEIS indicates that as permafrost soils warm, organic carbon reservoirs trapped in the ice are mobilized, causing carbon dioxide and methane to be released into the atmosphere. The total amount of permafrost soils along the pipeline that are predicted to thaw during operations and closure is 37 million tons with an additional 9 million tons of permafrost soil predicted to thaw during operations and closure (Page 3.26-43). For the proposed action and action alternatives, we recommend that permafrost soils and other biogenic resources, such as vegetation, wetlands and aquatic resources be quantitatively and qualitatively evaluated for the potential GHG emissions (CO_2-equivalent/acre) during project construction, and operations and maintenance.	
Emissions from Spill Scenarios	MJ	Chapter 3.24 (Spill Risk) evaluates the impacts associated with low probability, high consequence spill scenarios with an ocean barge rupture at sea, river barge release, tank farm release, tanker truck release, diesel pipeline release, LNG release, cyanide release, mercury release, and a partial tailings dam failure. We recommend that the spill scenarios be qualitatively and quantitatively evaluated in the EIS as they may represent a potential contribution to GHG emissions and climate change impacts, particularly spills of diesel fuel from barges, tank farms, trucks, and pipelines.	
Emissions Targets	MJ	The ability to meaningfully articulate emission reductions would be a valuable component of a mitigation package. One	

		approach we suggest is that the EIS identify reasonable GHG emission reduction targets or goals for some or all project components (e.g., mine, transportation facility, and pipeline) and development phases (e.g., construction, operations, maintenance, closure and reclamation). As the project progresses, periodic reports could show progress toward reaching the targets.	
Mitigation Measures	MJ	Chapter 5 (Impact Avoidance, Minimization, and Mitigation) includes design features (Table 5.2-1), mitigation measures (Table 5.5-1), and monitoring and adaptive management plans (Table 5.7-1) to mitigate impacts associated with the project. We recommend that the EIS further identify and describe measures for reducing and mitigating GHG emissions and climate change effects such as evaluating enhanced energy efficiency, lower GHG technology, and renewable energy. We recommend that the EIS disclose GHG reductions associated with such measures. EPA further recommends that the Record of Decision commit to implementation of reasonable mitigation measures that would reduce project-related GHG emissions.	
Reducing Emissions	MJ	The DEIS evaluates action alternatives that have the potential to minimize impacts to the environment. Alternative 3A (LNG Powered Haul Trucks) was carried forward for analysis because it would reduce the frequency of diesel fuel barging on the Kuskokwim River. This alternative may serve to reduce overall project GHG emissions and climate change impacts. Alternative 3A evaluates the use of natural gas powered trucks (+300-ton payload) that would move waste rock and ore from the open pits. These large trucks account for 75 percent of the total project diesel consumption. The conversion to natural gas powered trucks would reduce the diesel fuel consumption and increase natural gas usage by 28 percent. The reduction of diesel fuel required for operations could potentially reduce river barge traffic by 32 percent. Furthermore, truck traffic on the gravel road would be reduced by 75 percent, which would also result in a reduction of fugitive dust emissions. Alternative 3A could potentially reduce GHG emissions associated with river barges, trucks and fugitive sources. The DEIS indicates that Alternative 3A would not include using LNG for the trucks hauling cargo and fuel on the mine access road from Jungjuk Port. We recommend that Alternative 3A include the use of LNG for all vehicles and trucks and that the EIS disclose the quantitative estimates of GHG emissions associated with Alternative 3A. We recommend incorporating Alternative 3A into the proposed action as a measure for reducing overall project GHG emissions. Reclamation and revegetation of certain disturbed areas, such as the waste rock facility and the tailings storage facility could reduce the overall project climate change impacts and result in the conversion of a carbon emission source to carbon storage or sink. We recommend that the EIS qualitatively and quantitatively evaluate mitigating climate change impacts through the reclamation and revegetation of disturbed areas, including wetland enhancement or restoration, and potential conversions from carbon source to carbon sink. In July 2015, the EPA launched the Natural Gas STAR Methane Challenge. This is a new voluntary program for reducing methane emissions. Methane, the primary component of natural gas, is a potent greenhouse gas with a global warming impact 25 times that of carbon dioxide. Companies who sign up for the program agree to make commitments for methane emission reductions, with accountability and transparency in progress in achieving those commitments, and with the potential for public recognition for leadership in reducing GHG emissions in the United States.	
Climate Change Resilience	MJ	We recommend the Corps consider modifications to the design of the proposal to incorporate resilience to foreseeable climate change. For example, the DEIS states that permafrost is predicted to thaw within the project area. Permafrost	

			stability or anticipated changes to existing permafrost conditions can affect settlement and ground stability characteristics that would in turn significantly influence design and construction of project components such as facilities and infrastructure.		
Table 3.26-1	3.26-7	MJ		Throughout the Climate Change section (3.26), the DEIS compares total expected project level GHG emissions with estimated Alaska, U.S and global GHG emissions. The DEIS also compares the expected project level GHG emission with major industrial sectors in Alaska. We recommend that the EIS not include the broader comparisons. These comparisons obscure rather than explain how to consider GHG emissions under NEPA. Climate change is a global problem resulting from the emissions of many individual sources whose impacts are cumulative. The environmental impacts are best described by using emissions as a proxy to compare the proposal, alternatives, and potential mitigation.	
3.26.4.2	3.26-25	MJ	Alternative 2 – Donlin Gold's Proposed Action	DEIS has disclosed projected quantitative estimates of GHG emissions (as CO_2-equivalent) for the construction, operations, maintenance, and closure phases of the mine site; the construction, operations, and maintenance for the transportation facilities (on land, air and river); and the construction, operations and maintenance phases for the pipeline. Chapters 3.8 (Air Quality) and 3.26 (Climate Change) provide a summary of the quantitative estimates of GHG emissions for Alterative 2, the proposed action. We recommend that the EIS include a description of the tools, methodology, models, and scientific research information used to quantify these emissions.	
3.27 Other Impact Considerations					
No Comments					
Chapter 4. CUMULATIVE EFFECTS					
4.2	1	cg	The purpose of cumulative effects analysis is	The purpose of the cumulative effects analysis is	
4.2.1	4=2	MJ	Temporal and Spatial Scope of Analysis	We recommend that the cumulative effects spatial analysis	

				area (Figure 4.2-1) be expanded to include the ocean vessel traffic route and potential direct, indirect, and cumulative impacts from the lower 48 United States (Seattle, WA) and Canada (Vancouver, BC) to/through Dutch Harbor and Bethel, as mentioned in Table 4.2-1. The analysis area should also include the transportation of the gold doré bars for final refinement, which is a reasonably foreseeable future action. Since pipeline supplies would be brought in through Port MacKenzie and/or the Anchorage Port in upper Cook Inlet, the direct, indirect, and cumulative impacts associated with these facilities and activities should be evaluated in the EIS.	
Table 4.1-1		MJ		The DEIS describes the past, present and reasonably foreseeable future actions considered in the cumulative effects analysis. We recommend that the estimates of GHG emissions for these past, present, and reasonably foreseeable future actions be quantified and disclosed in the EIS, to the reasonable extent possible. This information is necessary to understand the cumulative effects of climate change impacts in the region and the contributions for GHG emissions from the Donlin Gold Project.	
4.2.1	4-3	MJ	Text references Figure 4.2-1	On Page 4-4 is the actual figure, but the caption shows Figure 4.3-1.	
4.3.1.1.1	13	cg	The BTC Road is 43 miles longer than the mine access road	The description of Alternative 4 on page 2-152 says the road is 46 miles longer	
4.3.1.1.1	13	cg	While the BTC Road would utilize gravel aggregate sourced from 5 material sites compared to only 1 for the mine access road under Alternative 2,	Table 2.3-9 list 14 material sites for the A(J) road while Table 2.3-37 lists 50 for BTC road	
4.3.1.1.2	15	cg	There are 25 bedrock material sites along the BTC Road	Table 2.3-37 lists 50 material sites for the BTC road, are only half of them bedrock material sites?	
4.3.1.1.2	15	cg	Alternatives 2 and 5Aat	Alternatives 2 and 5A at	
4.3.1.2.1	18	cg	the 73-mile long BTC Road would be about 43 miles longer than the mine access road under Alternative 2.	The description of Alternative 4 on page 2-152 says the BTC road is 76 miles long so is 46 miles longer	

4.3.1.2.1	18	cg	and more major stream crossings requiring bridges under Alternative 4	but Alternative 4 has fewer stream crossings overall so fewer culverts which have some erosion potential	
4.3.1.2.1	18	cg	A more robust Erosion Sediment and Control Plan and BMPs	ESC previously used for “Erosion Sediment and Control” but not previously short cited in this chapter	
4.3.1.2.2	21	cg	The 73-mile long BTC Road would be about 43 miles longer than the mine access road under Alternative 2, or about 2.4 times longer,	The description of Alternative 4 on page 2-152 says the BTC road is 76 miles long so is 46 miles longer and as such is 1.53 times longer	
4.3.1.5.2	26	cg	effects in the Kuskokwim watershed above the BTC Port under Alternative 3A;	A port is not proposed at BTC in this alternative	
4.3.1.7.2	29	cg	creation of the WRF, TSF, and pit lake; however, due to perpetual management and water treatment, water from these facilities would not leave the onsite watersheds. Effects from mine site waters on the environment would be mostly of low intensity, as all water would be treated to meet water quality standards prior to discharge to Crooked Creek.	did this mean to say 'untreated water' would not leave the onsite watersheds? or is Crooked Creek counted as an "onsite watershed"?	
4.3.1.7.2	32	cg	The 73-mile long BTC Road would be about 43 miles longer than the mine access road under Alternative 2,	The description of Alternative 4 on page 2-152 says the BTC road is 76 miles long so is 46 miles longer	
4.3.1.7.3	33	cg	in groundwater are higher in the vicinity of the Donlin ore body than outside this zone; conditions that are expected to be similar at other mines	Should “mines” be “ore bodies” since not every orebody becomes a mine but most ore bodies impact ground water in the vicinity	
4.3.2.2.1	38	cg	have removed some wetlands and introduced or spread invasive species.	The highlighted text was also included in the vegetation section, should it be here too?	
4.3.3.6.2	51	cg	from Alternative 2with	from Alternative 2 with	
4.3.3.8	4-52	MJ	Human Health	Since the HIA was not included in the DEIS for public review, we are not certain how cumulative effects have been evaluated for human health. We recommend that the cumulative effects of multiple sources, pathways, and exposures from past, present and reasonably foreseeable future actions, including mine operations and accidental chemical spills, to humans be evaluated in the EIS. A risk based assessment should be conducted to evaluate all	

				potential sources, pathways, and routes of human exposure to contaminants from air, water, and subsistence foods. We recommend that the EIS describe the acceptable limits for contaminant exposure to subsistence foods and water. Biological monitoring of human health should be conducted to evaluate the cumulative impacts during the active mine life and post closure.	
	52	JS		The statement that the geographic area of analysis for health is the state of Alaska appears different than the analysis section.	
	53	JS		It is unclear how a broad statement about the health impact of the reasonably foreseeable actions can be made without analyses done to support that claim. As an example, climate change is noted to be a reasonably foreseeable action, and then a statement is made that reasonably foreseeable actions would likely induce minimal changes to human health in this area. No support is given for this statement.	
4.3.3.8.1	53	cg	Alternative 2 would have medium direct indirect impacts	Should it be "direct and indirect" or one or the other?	
4.3.4	55	MJ	Cumulative Effects and Climate Change	The DEIS (Table 4.2-1) describes the past, present, and reasonably foreseeable future actions considered in the cumulative effects analysis. We recommend that the estimates of GHG emissions for these past, present, and reasonably foreseeable future actions be quantified (CO_2-equivalent) and disclosed in the EIS, to the reasonable extent possible. This information is necessary to understand the cumulative effects of climate change impacts in the region and the contributions for GHG emissions from the Donlin Gold Project.	
4.3.4.2	56	cg	described in above Section 4.2.2, Affected Environment.	described in Section 4.2.2, Affected Environment, above.	
Chapter 5. Impact Avoidance, Minimization, and Mitigation					
General Comment		MJ	The DEIS should clarify the design features, mitigation measures, monitoring and adaptive management that would address NEPA and CWA Section 404 permitting requirements. We recommend that the EIS include additional discussion regarding how the proposed design features and mitigation measures under the NEPA requirements will be monitored, tracked, and		

			reported by the project proponent and permitting agencies. We recommend a commitment be made in the EIS that a **Mitigation Implementation Plan** would be developed for the proposed design features, mitigation measures, and BMPs during project construction, operations and maintenance, and closure. We encourage the project proponent to actively engage the local communities in conducting the monitoring activities. The EIS should include a commitment to develop an Annual Mitigation Report that would be presented to the tribes, the public and the agencies for review. The **Mitigation Report** should track and summarize the successes and problems with each type of mitigation, and should include recommendations for additional design features, mitigation measures, and BMP, as appropriate, to address future project needs and requirements. The Mitigation Report should outline an adaptive management approach where successful mitigation measures would no longer require monitoring, and that monitoring efforts would shift to those design features, mitigation measures, and BMPs to achieving success.	
Table 5.2-1	6	cg	Alaska Native shareholders (minority and low income).	What comparison was made to determine that Alaska Native shareholders are a minority population?	
5.2	8 & 9	KW	Table 5.2-1: Design Features; specifically A24, A26	What are the assurances that these design features will be carried out? Elaborate on how the applicant and regulatory agencies will ensure these design features will be carried out as proposed. We suggest a mitigation design feature reporting plan which documents whether or not such measures were carried out and if not why. This is important as these design measures were considered in the ranking of the various alternatives in terms of environmental consequences. Failure to carry out some of these designs may be grounds for additional mitigation requirements post mining. We request there be additional discussion which details how design feature implementation will be monitored and tracked by the applicant.	
5.2	5-9	KW	M1: In final design, site infrastructure, material sites, and roads would avoid ground-disturbing activity in wetland areas whenever practicable. Details would be developed as the mitigation plan is developed and as design and permitting progress. Those details do not exist at the DEIS stage.	We request there be additional discussion which details how design feature implementation will be monitored and tracked by the applicant.	
5.2	5-11	KW	M11:The 404(b)(1) analysis will document the steps taken to minimize wetlands impacts.	Cite where this specific analysis is located in the DEIS and where specifically in the 404 application.	

5.3	19	cg	The Alaska Department of Natural Resources' (ADNR's)	ADNR previously used without short citing	
5.3	19	cg	required by the Alaska Department of Environmental Conservation (ADEC)	ADEC previously used without short citing	
5.5	22-32	KW	Table 5.5-1: Mitigation Measures being Considered by the Corps: The information in these columns is an initial assessment that will be modified and/or further detail added based on agency and public review comments.	Under feasibility/likelihood of effective implementation it would be more informative if information was provided on the potential success of the mitigation or the level of environmental lift an activity might provide. A ranking system would be appropriate and put the proposed measures into prospective.	
5.5	22	KW	Table 5.5-1 Mit 1: Restore flat-to-gently sloping wetlands by removal of fill at project closure where feasible. Removed fill would be moved to approved upland areas. Details would be developed as Donlin Gold's Conceptual Compensatory Mitigation Plan is developed and as design and permitting progress. Those details do not exist at the DEIS stage.	Will this may be a measure that can be legally required through a permit and practicably carried out, we request there be some discussion or ranking of the feasibility in terms of actually restoring wetlands in the post mining landscape and the potential success of that mitigation given the information provided in the Wetlands section on environmental consequences (i.e. the inability in restoring fen and bog wetlands and the difficulty in restoring wetlands in general). This table should provide some indication of the overall uncertainty of implementing the measures proposed and the level of analysis that still needs to occur to determine if a measure is even possible (e.g. propagation and test plot success (variable)).	
5.5	33	KW	As discussed in Section 3.11.1 Wetlands, and Appendix M, Donlin Gold has developed a conceptual Compensatory Mitigation Plan in coordination with federal, state, and local governments and landowners.	Wetlands are not the only resources requiring mitigation. Where is the discussion of stream mitigation? Please reference where and if stream mitigation is discussed in other sections of the mitigation outside of Appendix M. Stream mitigation should be referenced here as well.	
5.6	33	cg	40 CFR Part 230 (U.S. Environmental Protection Agency [EPA]).	EPA previously short cited on page 5	
Chapter 6. CONSULTATION AND COORDINATION					
No Comments					
Chapter 7. LIST OF PREPARERS					
No Comments					

Chapter 8. DISTRIBUTION					
No Comments					
Chapter 9. REFERENCES					
GLOSSARY OF TERMS					
No Comments					
APPENDICES					
A. FINANCIAL ASSURANCE					
General Comment		MJ	The EPA appreciates that the DEIS provides disclosure of the financial assurance (FA) cost estimates associated with implementing the reclamation and closure plan and long-term monitoring (Appendix A). We also note that the FA includes the costs associated with the removal, abandonment, and reclamation of the natural gas pipeline. The Standardized Reclamation Cost Estimator (SRCE) model was used to calculate the FA costs for mine closure. The FA assumes partial backfilling of the open pit and modification of tailings operations at the end of the mine life. If the mine were to close prematurely, the modifications and operations would not have been performed and the actual maximum cost of reclamation might occur under such circumstances, which may also include not having completed planned pit backfilling or final tailings deposition. We recommend the EIS disclose whether this represents a reasonable maximum cost scenario that should be considered by a pre-mature mine closure scenario. Furthermore, the EIS should discuss how a premature mine closure would affect financial assurance for closure and reclamation and payments to establish the Donlin Gold Trust Fund for long-term monitoring (Appendix A). It is our understanding that models have been used to evaluate the financial assurance estimates during different timeframes of the active mine life. A figure outlining funding throughout the active mine life and closure should be included in the EIS.		
Appendix A	6	MJ	The indirect costs, which is expressed as a percentage of direct costs and range from 8% to 40%.	Donlin has indicated that the indirect costs applied to the SRCE model calculation is 27 percent. EPA has also been involved with the FA estimates for the Greens Creek Mine in Southeast Alaska, which utilized an indirect cost of 41 percent. Some of the differences are explained by the project scale (larger projects result in less indirect costs as a percent of direct costs). We recommend that the EIS discuss the reasons for the differences in indirect costs as applied to the two mine sites in Alaska.	
B. SCOPING REPORT					

No Comments			
C. ALTERNATIVES DEVELOPMENT PROCESS			
No Comments			
D. PIPELINE ENGINEERING STRIP MAPS			
No Comments			
E. PHMSA ENCLOSURE B			
No Comments			
F. SOILS			
No Comments			
G. STREAM CROSSINGS DATA TABLES			
No Comments			
H. GEOCHEMISTRY			
No Comments			
I AIR QUALITY			
No Comments			
J. USACE Section10 Rivers and Harbors Act/Section 404 Clean Water Act Permit Application			
General Comments			
	MJ	The current information and analysis in the DEIS is not adequate to fully evaluate the potential adverse impacts to wetlands and aquatic resources under the CWA Section 404(b)(1) guidelines. In addition, the conceptual compensatory mitigation plan is not adequate since the wetlands jurisdictional determination has not been approved. The Corps' proposed changes to the wetlands functional assessment methodology and estimates of wetland impacts evaluated in the DEIS would result in the development of substantively new information and analysis in the EIS in Chapter 3.11 (Wetlands). It is our understanding that a supplemental, revised and/or corrected public notice will be issued if changes in the application data would affect the public's review of the proposed action (see 33 CFR 325.2, 325.3). Furthermore, potential project modifications after public review and comment of the DEIS may require the project proponent to submit a revised Section 10 Rivers and Harbors Act/Section 404 Clean Water Act application to the Corps at the EIS stage. For actions subject to NEPA, where the Corps is the permitting agency, the analysis of alternatives required for NEPA documents, including supplemental Corps NEPA documents, will in most cases provide the information for evaluating	

			alternatives under the 404(b)(1) Guidelines. On occasion, however, these NEPA documents may not have considered the alternatives in sufficient detail to respond to the requirements of the Guidelines. In the latter case, it may be necessary to supplement the NEPA documents with this additional information [40 CFR 230.10(a)(4)]. In summary, the current information and analysis in the DEIS is insufficient to fully evaluate adverse impacts to wetlands and aquatic resources under the CWA Section 404(b)(1) guidelines. We therefore recommend that the Corps provide complete and accurate information when it is available, and release the revised analysis for public review comment and make sure that the new information is captured in the EIS. Doing so will provide the public with an opportunity to review and comment on the new information and analysis, and potential project changes prior to the issuance of the Record of Decision and the CWA Section 404 permit.		
Withdraw PN		MJ	We recommend that the Department of Army PN issued with the DEIS be withdrawn. We recommend that the Corps issue a supplemental, revised or correct PN for review and comment with new information in the EIS regarding the wetlands functional assessment and accurate estimates of wetland impacts.		
		KW	The DEIS does not appear to contain the full ACOE 404 application. For example, the sections referenced in the Blocks on Form ENG 4345 are not included in the DEIS or available on the donlingoldeis.com website (e.g. Section 1.0 & 2.0 supplemental information and Appendix A). The DEIS needs to include the full 404 application rather than the summary of changes made since the 2014 application submission.		
Cover page	Cover page	KW	Updated drawings showing the proposed project plans and footprint overlain on mapped wetlands as well as typicals and cross sections can be accessed at www.DonlinGoldEIS.com.	Be specific as to where these are exactly on the website (i.e. /EISDocuments "Section 10/404 Draft Permit Application Drawings"). Considering the amount of information on the site it was not easy to find.	
5	5	KW	A stand-alone final permit application that includes relevant updates will be submitted following completion of the revised PJD.	Provide a schedule for the anticipated completion of the revised PJD and submission of a final application. The EIS needs to clarify the status of the 404 application throughout *the entire document*. The schedule should reflect and document that the 404 application has been submitted to the Corps and deemed complete enough by the Corps to be put on public notice.	
K. WETLANDS ADDITIONAL TABLE					
No Comments					
L. Wetlands Pipeline Strip Maps					
No Comments					
M. Compensatory Mitigation Plan					

General Comments			
Mitigation Rule Requirements	MJ	In 2008, the Corps and the EPA jointly issued a new rule on *Compensatory Mitigation for Losses of Aquatic Resources* (Mitigation Rule). The mitigation rule establishes performance standards and criteria for the use of mitigation banks, in-lieu fee mitigation programs, and permittee-responsible mitigation (e.g., restoration, enhancement, establishment, and preservation) to improve the quality and success of compensatory mitigation projects. We recommend that the EIS disclose how the Corps plans to evaluate the requirements of the mitigation rule and the compensatory mitigation for the Donlin Gold Project. EPA notes the inclusion of the Conceptual Compensatory Mitigation Plan (CMP) in the DEIS (Appendix M). We have concerns that the mitigation banks and In-Lieu Fee programs proposed in the DEIS and the CMP either have not been approved by the Corps and/or are not currently active. We recommend that evaluation of additional compensatory mitigation options be included in the CMP and the EIS. The CMP should take a watershed approach to evaluating the temporal loss of wetlands and aquatic resource functions and values, and demonstrate that all direct, indirect, and cumulative impacts to wetlands and aquatic resources functions and values have been adequately replaced. Temporal losses would need to consider that newly restored wetlands would not have similar functional capacity as the original pre-disturbed wetlands for decades.	
Permittee Responsible Mitigation	MJ	At this time, Permittee Responsible Mitigation (PRM) may be a viable option for compensatory mitigation. We recommend that PRM plans and activities in the CMP focus on the following: (1) restoration of previously existing wetlands or waters; (2) enhancing or improving functions of existing wetlands or waters; (3) creation of new wetlands or waters; and (4) preservation of existing wetlands or waters. We recommend that the CMP discuss how PRM would be monitored to ensure project success in meeting certain performance standards, and to address any restoration problems through corrective actions. Additional PRM options include evaluation of river bank enhancement and restoration projects for the Kuskokwim River, Crooked Creek, and other impacted surface waterbodies within the project watersheds. Mine site facilities, such as the contact water ponds, diversion ditches, ore stockpile berms, should be fully restored to functional wetlands and aquatic resources.	
Stream Bank Restoration	MJ	As part of the CMP to offset losses to wetlands and aquatic resources under CWA Section 404, we recommend the evaluation of stream bank habitat restoration of the Kuskokwim River and Crooked Creek. Using the baseline bank erosion information attributable to these barge operations, we recommend that the project proponent coordinate with local communities to identify, inventory, and map segments of the river where significant bank erosion has occurred. We recommend that monitoring activities focus on river erosion rates and new areas of erosion and that the EIS and CMP further describe the frequency and methods of monitoring. We recommend that a process be in place to prioritize stream bank restoration projects, as described in the CMP.	
Mitigation Banks	MJ	A mitigation bank is another viable option to provide compensatory mitigation to offset impacts to wetlands and aquatic resources. We recommend the project proponent develop its own mitigation bank for the Donlin Gold Project. This could be accomplished by developing a mitigation banking prospectus and instrument for an entity to purchase wetland property for preservation and/or restoring, enhancing, and/or creating additional wetlands in the impacted watershed areas. The	

			mitigation bank should include a functional assessment method to determine the level of credits available to offset the project impact debits.		
Corps' Bonding Authority		MJ	If the CMP is determined not to be acceptable in the Corps' Record of Decision, then we recommend the Corps use their bonding authority as described in Regulatory Guidance Letter (RGL) 05-1. This RGL supports the use of financial assurance and includes suggested language for special permit conditions to establish a funding mechanism to provide compensatory mitigation to offset wetland impacts during the project lifecycle. We recommend the Corps establish a bonding and financial assurance instrument for compensatory mitigation prior to permit issuance. The Alaska State Implementation Review Team (SIRT) should be responsible for overseeing the bonding instrument and ensuring that compensatory mitigation for the Donlin Gold Project is being implemented.		
2.1	4	KW	Avoidance and minimization measures are detailed in the Department of Army Permit Application (Donlin Gold 2014).	Provide a summary of what the 404 application avoidance and minimization measures entail in this section. The 404 permit included in Appendix J does not appear to be complete and does not include a discussion on avoidance and minimization measures nor does the application on the Donlin Gold EIS website.	
2.2	5	KW	Donlin Gold, in a meeting with USACE in May of 2015, agreed to complete and submit a new PJD with the wetlands outlining the project footprint remapped according to the 2007 Alaska Regional Supplement Version 2 (V-2) encompassing the mine facilities and the pipeline footprint for the Final EIS (FEIS), thus the wetland acreages in Table 3-1, Table 3-2, and Table 3-3 will change in the FEIS.	The fact that the Draft EIS does not have the exact wetland acreage impacts will make it difficult to identify the LEDPA under the 404(b)(1) Guidelines. Discussions on the adequacy of mitigation measures are premature when wetland impacts are still undetermined.	
2.2	5	KW	Donlin Gold developed a functional assessment (FA) method using the Magee-Hollands method. The FA was the basis for the CMP. The USACE informed Donlin Gold the Magee- Hollands method is not intended for use in Alaska (USACE 2015). Subsequently the USACE informed Donlin Gold the FA should revert to a Cowardin classification and acreage method (July 30, 2015 meeting note).	The Cowardin classification and acreage method is not a functional assessment but merely a classification and quantification of acres of wetland. This point needs to be clarified in the text. The new method imposed fails to assess the wetland functional loss on site and therefore will be less informative to assist in determining adequate mitigation for the project.	
4.1	10	KW	Donlin Gold will follow the FA method prescribed by USACE, and use a Cowardin classification and acreage comparison methodology to determine the debits for the project.	This methodology is not a functional assessment. This section needs to specifically describe the Cowardin classification and acreage comparison methodology. If there is a functional component to this method, a better discussion is needed.	

4.1.1	10	KW	Donlin Gold can propose to compensate for wetland loss by preserving wetlands of equal value by the restoration or enhancement of wetlands. USACE historically has required a smaller mitigation ratio for projects proposing restoration or enhancement of wetlands when compared to projects preserving wetlands. USACE requires a ratio greater than 1:1 ratio for wetland preservation. USACE makes the final decision on mitigation ratios.	"Donlin Gold can propose to compensate for wetland loss by preserving wetlands of equal functions and value by the restoration or enhancement of wetlands. USACE historically has required a ~~smaller~~ lower mitigation ratio…" For clarity, we recommend you cite the Federal Mitigation Rule. "The district engineer must require a mitigation ratio greater than one-to-one where necessary to account for the method of compensatory mitigation (e.g., preservation), the likelihood of success, differences between the functions lost at the impact site and the functions expected to be produced by the compensatory mitigation project, temporal losses of aquatic resource functions, the difficulty of restoring or establishing the desired aquatic resource type and functions, and/or the distance between the affected aquatic resource and the compensation site. The rationale for the required replacement ratio must be documented in the administrative record for the permit action – CFR 230.93(f)(2)" Further, it should be documented that for difficult-to-replace resources like bogs, fens, springs and streams – all of which are proposed to be impacted by the project, the required compensation should be provided through in-kind rehabilitation, enhancement or preservation as this will provide greater certainty that these methods will successfully offset permitted impacts.	
5.0	12	KW	Compensatory Mitigation Section: General Comment	Provide an estimate of linear feet of potential stream mitigation and wetland mitigation – a summary table of mitigation based on the entire analysis in the CMP based at this point in the process (DEIS/FEIS) and identify any areas where you may be deficient given the comments made regarding the lack of mitigation bank and ILF opportunities in the state. Appendix C Table 8, page 12 provides some summaries but they are by subwatershed for PRM only, and not for the entire project.	
5.2.1	12-13	KW	Mitigation Banks	Recommend providing a summary table of the type and amount of credits currently available (or anticipated to be available) at the federal banks discussed in this section to	

				provide some perspective/content on the extent of mitigation credits these banks might provide (i.e. the percentage of the anticipated mitigation that might come from bank credits).	
5.2	13	KW	Mitigation bank credits will be available for the permanent and temporal impacts in waters of the United States for the pipeline (PSA) in the Matanuska Susitna Borough.	The CMP should contain a separate section and discussion on temporal impacts, the anticipated temporal loss from the proposed projects and how the applicant will address temporal loss outside of the use of mitigation banks and detail the extent of temporal loss the mitigation banks might provide. At this point, the use of mitigation banks, given the small number of approved and pending banks, and PRM sites will likely not provide the mitigation needed for the temporal loss of resources for the 30 to 50 year life of mine and time needed for reclamation on site.	
Appendix C	4	KW	The pond features are considered highly feasible, successful plan attributes that add diversity of aquatic functions and habitat within the overall stream system. Site assessments will need to be conducted to determine physical characteristics for best stream alignment and connectivity, as well as opportunity to extend shoreline and shallowly inundated riverine marsh habitat.	This implies that pond features will be maintained as open water areas rather than converted back into stream systems providing stream functions. Please clarify if this is the case and detail the specific functions that it will provide that would compensate for lost stream functions and what additional mitigation would be provided to compensate for lost functions not provided by open water areas.	
C.1	13	KW	Table 10 – Reported Fish Findings by Mitigation Area Watershed/Sub-watersheds	Why is this blank? What is the anticipated post-mitigation fish findings? What is anticipated – detail the goals and objectives? All species? Some?	
C.1	25	KW	One of these procedures, as described in *A Rapid Procedure for Assessing Wetland Functional Capacity: Based on Hydrogeomorphic (HGM) Classification* (Magee and Hollands 1998), served as the basis for the wetland FA in the Donlin Gold project area.	Considering the Corps deemed this methodology not appropriate for Alaska, the language needs to be changed or additional language added to reflect this.	
C.1	27	KW	Table 17 describes the individual mitigation components planned for this work area and the construction timing and installation sequence.	The construction and installation sequencing needs to be more detailed and include at which point during the 25 to 30 year life of mine each of the individual mitigation components is anticipated to occur since the applicant seemed to be proposing a sequenced mining with sequenced and phased mitigation. This will help in determining temporal loss of resources and determination of adequate mitigation for such	

				loss. This is further support for a separate section which focuses solely on temporal loss and how the applicant proposes to compensate for temporal loss.	
C.4	5	KW	Donlin will receive an acre to acre restoration and enhancement credit based on the HGM class of wetland acres restored or enhanced.	An acre to acre or 1:1 ratio for restoration and enhancement credit is not a given and may not be consistent with the Federal Mitigation Rule. The language needs to reflect what the Rule requires: "the amount of required compensatory mitigation must be, to the extent practicable, sufficient to replace lost aquatic resource functions. In cases where appropriate functional or condition assessment methods or other suitable metrics are available, these methods should be used where practicable to determine how much compensatory mitigation is required. If a functional or condition assessment or other suitable metric is not used, a minimum one-to-one acreage or linear foot compensation ratio must be used." Further "The district engineer must require a mitigation ratio greater than one-to-one where necessary to account for the method of compensatory mitigation (e.g., preservation), the likelihood of success, differences between the functions lost at the impact site and the functions expected to be produced by the compensatory mitigation project, temporal losses of aquatic resource functions, the difficulty of restoring or establishing the desired aquatic resource type and functions, and/or the distance between the affected aquatic resource and the compensation site. The rationale for the required replacement ratio must be documented in the administrative record for the permit" Enhancement does not result in a gain of wetland acres and as such, may not receive as much credit as a full restoration. This needs to be recognized. Change the language to reflect the Rule or provide justification for the determination of a 1:1 ratio for enhancement. (i.e. the functions gained vs. functions lost).	
C.5	2&3	KW	…to educate the local governments on how to run and operate the local landfills and encourage the removal of derelict recyclable goods from the watershed.	While education to the community on environmental stewardship is encouraged it is not appropriate mitigation for direct, cumulative and secondary impacts to aquatic resources	

				under Section 404 of the Clean Water Act. This funding may be better served by preserving or enhancing other resources in the area would be more adequate mitigation for 404 impacts posed by the projects.	
C.6 1.1	1	KW	A rock cover will be installed on the tailings when the moisture content is adequate to support the load.	Specify the acceptable moisture content to support this load. Estimate the amount of time anticipated for the moisture content to reach this level and be able to support the load.	
C.6 1.1	1	KW	The surface drainage would be managed to ensure the vegetation is saturated and the water does not infiltrate the consolidated tailings below the engineered cap.	Provide more detail on how hydrology would be managed or the measures that would be implemented to ensure water does not infiltrate the tailings.	
C.6 2.0	4	KW	Table 1. #7 Hydrology Does the site have sustainable hydrology? Yes, surface water groundwater and rainfall	Is groundwater going to be a source of hydrology? The underlying tailings is directly below the proposed site and it has been previously stated that the mitigation is designed so that there is little interaction between tailings and wetlands. Elaborate on if and how groundwater will feed this system.	
C.6 4.0	5	KW	The two types of flats (mineral soil and organic soil) have been combined into a single flat class,	The combination of organic and mineral soil flat wetlands into a single HGM "Flats" class is potentially problematic. These classes likely do not support the same vegetation cover types, or do not have similar values for many of the measured or observed variables (e.g., pH).	
C.6 5.0	5	KW	A reclamation manual report will be generated that establishes what wetland planting processes were successful and which were failed. The report will become a manual to serve as a tool for other mines and large projects. An additional boost in wetland credits of 10% will be granted for the creation of a manual and the sharing of this information.	This does not provide adequate mitigation for direct, cumulative and secondary impacts to aquatic resources. A 10% credit is not justified.	
C.6 5.0	5	KW	Donlin Gold is considering establishing a greenhouse and onsite cultivation services to provide local wetland plant species. The seedlings will be developed in coordination with the Palmer Plant Materials Lab. Donlin Gold proposes that a Greenhouse will provide additional wetland credits for the site. An additional boost in wetland credits of 15% for the creation of these services to the region is part of	While this does help in the propagation of vegetation needed to establish wetlands on the site. This does not provide adequate mitigation for direct, cumulative and secondary impacts to aquatic resources. A 15% credit is not justified.	

			this plan		
C.6 6.0	6	KW	Predicted near terminal density will be reached approximately 52 years after the end of operations.	Define or clarify "near terminal density". Clarify whether or not it would be prudent to try to establish wetlands on the site at the end of operations or until 52 years after closure? Clarify whether it may take the entire 52 years for this site to establish sustainable wetlands. Indicate at what point after closure of the TSF, the proposed wetland might become successful established and meeting performance standards.	
C.6 4.0	3	KW	The major wetlands to be impacted by the pit lake will be HGM flat wetlands followed by slope wetlands, and riverine wetlands. The projected wetlands loss from the mine pit is approximately 878 acres. This project will replace the wetlands lost by the mining of the pit with fringe wetlands around the lake edge and a 1,007 acre pit lake.	This does not provide adequate mitigation for direct, cumulative and secondary impacts to aquatic resources (rivers, streams and wetlands). Please describe how a pit lake replaces the functions from the loss of 878 acres of HGM flat (organic and mineral) wetlands; especially given the fact that the lake will never meet Alaska State WQS.	
C.6 9.0	11	KW	Hydrologic monitoring will be limited to surface water depths associated with wetland delineations.	We recommend additional or more rigorous long-term monitoring over the visual and one time hydrologic assessments made during a wetland delineation.	
C.11 7.0	5	KW	If maintenance becomes necessary, the adaptive management plan will address how each item will be maintained (removal of sediment, planting trees, changing channels, or adding vegetation, etc.).	Considering the majority of the work is the destruction of beaver dams, there needs to be some long term monitoring and maintenance to address the fact that beaver activity will resume long term. Provide additional discussion about that in this section, as well as 9.0 Monitoring, 10.0 Long term monitoring and 11.0 Adaptive management.	
C.12	2	KW	In order to provide a quantitative measurement of these effects, this plan uses *A Rapid Procedure for Assessing Wetland Functional Capacity* (Magee and Hollands 1998).	Considering the Corps indicated this method was not acceptable for use in Alaska, this method should be removed and an additional method for determining functional gain for the proposed work should be included or the current methodology being used – as stated previously (i.e. Cowardin and acreage methodology).	
N. Section 810 Analysis					
No Comments					
O. Biological Assessments					

No Comments
P. Corps Initiation of the Government-to-Government Consultation
No Comments
Q. EFH Assessment
No Comments
R. Oil Discharge Prevention and Contingency Plans
No Comments
S. Pit Lake Ecological Risk Assessment
No Comments
T. Visual Pipeline Engineering Strip Maps
No Comments